THE IRON AGE

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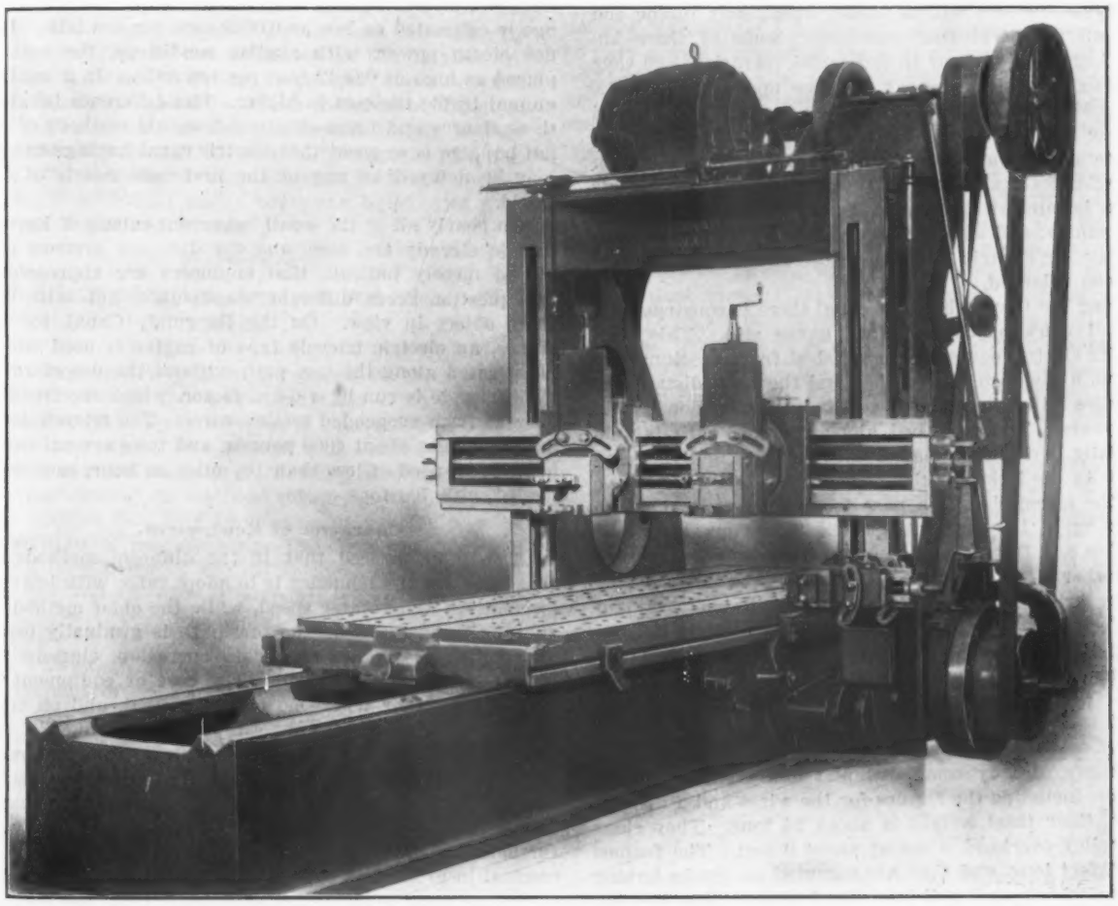
THE IRON AGE

THURSDAY, OCTOBER 29, 1903.

The Cincinnati Motor Driven Planer.

The accompanying half-tone illustrates a new motor driven planer having a variable speed cutting stroke, with a uniform return at all times, and using a constant high speed standard motor. The engraving shows how the power is transmitted from the motor to the rear or constant speed shaft by a pair of gears, one of which is rawhide to obviate noise. This first or constant speed shaft carries the return pulley, and therefore gives the table always one speed for the return stroke. On this shaft is also mounted a heavy fly wheel, to relieve the motor at the reverse, which is placed between two bearings, all of which are made ring oiling. The pulley for the cutting stroke is placed on a separate or forward shaft on top of the housing, and power is transmitted from the constant shaft to this one by two trains of gearing, each giving two speeds, the combination consequently giving four cutting speeds to the platen by simply moving one or both of the two levers shown on the side of the planer. The changes can be made while the machine is in operation or standing idle. This makes an ideal drive, especially for large machines, when it is desired to place them under the crane or where there is no room overhead for any style of variable speed countershaft; and it also overcomes the two chief objections to a planer driven by a variable speed motor, which reduces the power on the slow speed and runs the return speed far beyond its limit when a high cutting speed is desired. Variable speed motors are rarely carried in stock and must therefore be ordered specially, which usually means a long wait, not only for the new motor but also for any repairs should they be needed later on. The cut illustrates a 48 x 48 inch planer, but this same style drive has been applied to all other sizes of machines which the Cincinnati Planer Company, Cincinnati, manufacture. The speeds used on the machine illustrated were arranged for 20, 25, 30 and 38 feet per minute, with a constant return of 72 feet. A brass index plate is fastened to the side of the housing (not shown in cut), so that a glance will tell what speed is being used.



THE CINCINNATI MOTOR DRIVEN PLANER.

The project of establishing a large electrical plant on the Housatonic River at Kent, Conn., is now assured and the work of developing the water power will begin soon. The right of way for the electric line has been secured by the Connecticut Railway & Lighting Company, who are developing this power for the purpose of operating a part of their large system. The cities of Waterbury and New Britain will be supplied with electric power from this plant, and in addition the Milldale, Southington & Compounce Railroad and the new Cheshire and Mt. Carmel Branch, which are lines operated by the Connecticut Railway & Lighting Company. It is expected that when this power is in operation the steam power stations at New Britain, Southington and Waterbury will be abandoned, but this will not be until nex year. The high potential line from the Housatonic Rive power station to Waterbury will be in duplicate. Fron Waterbury beyond to New Britain a single line will suf fice. The new station will mean a great economy i operation by the Ra'lway & Lighting Company.

Recent Canal Haulage Improvements.

BY GEORGE E. WALSH.

The continued agitation about deepening and widening the Erie Canal makes some of the recent improvements in canal haulage in Europe, and this country of more than special interest. The crude systems of canal haulage in the past have militated against their general popularity more than anything else, and until the problems surrounding the whole question could, in a measure, be solved there was little possibility of further expensive investments in such waterways. In the past decade millions of dollars have been invested in the dredging, widening and building of canals, but out of all proportion to these huge expenditures have been those devoted to the improvement of mechanical haulage. Nevertheless, the ultimate fate of the canals must depend upon the success attained through the adoption of modern mechanical haulage devices.

The Miami and Erie Canal System.

The electric haulage systems have received the most attention, and it is apparently in this direction that further improvements will be made, which may in the end solve all the perplexing questions. Some of these improved systems are now in successful operation, and they certainly represent a great advance upon old methods. On the Miami and Erie Canal, which runs from Cincinnati to Lake Erie at Toledo, the electric system which is being installed represents the most extensive application of mechanical canal boat haulage in the world. This system is interesting because it is the first of its kind in this country, and should it prove successful it may open the way for electric haulage on the Erie Canal when it has been enlarged.

Along the tow path of the canal there is constructed a railroad track of the standard gauge size. This road with its electric equipment is finished from Cincinnati to Dayton, a distance of 68 miles, and the total distance of 244 miles will be completed and in full operation within four years. The road bed along the tow path is substantially laid and ballasted, with oak ties and 70-pound rails. At the locks trestles of iron and steel are built so that the locomotives can pass from the low to the high grades up a 1½ per cent. grade. There are numerous switches and frogs provided so that locomotives can pass each other.

The bridges across the canal made it necessary for the electric road to dip down below the level of the water at places, and heavy concrete masonry walls are constructed at such points to protect the embankments and track from any overflow. Electric locomotives are designed to run over this track capable of towing fleets of from five to seven boats. These locomotives, half of which are already completed and delivered, are of 20 tons, or, including the frames for the wires and all equipments, their total weight is about 24 tons. They clear the trolley overhead wires at about 9 feet. The frames are 14 feet long, and they are mounted on trucks having 30-inch wheels and a 7-foot wheel base. They are operated by the three-phase current system, and the draw bar pull is from 6000 to 9600 pounds starting. The current is carried on two overhead wires and the track.

For the past 20 years the Miami Canal has been a losing venture, and the railroads have steadily diverted traffic from it. The present heavy investment in its electrical equipment promises to give new life to it, and considerable interest will be manifested in the final result. The present equipment is sufficient to accommodate 100 boats a day between Cincinnati and Dayton, but when finished this will be greatly increased.

European Systems.

In Europe electric canal haulage on a smaller scale has received more experimental attention than in this country, and a number of short routes have been equipped with mechanical devices for hauling the canal boats. The Teltow Canal, connecting the rivers Spree and Havel, is one of the most important, for when completed it will be possible to haul some 5,000,000 tons of freight per annum. Although in the primitive stages of construction the Teltow Canal is important because it represents what electrical engineers consider the most satisfactory equipments and devices yet perfected. The canal is only 40 miles in length, and its equipment will consequently be much smaller than that of the Miami Canal.

The Koettgen electric canal haulage system, which has been tested for some time on the Finow Canal, employs a single rail in places and a double one in others. In the single rail system the locomotive has a pair of broad tire wheels, spring suspended, which roll along on the ground nearest the canal. The weight of the engine rests mostly on the two small wheels which run on the rail opposite, and which are grooved to fit it. This type of locomotive is propelled by a 15 horse-power motor, and makes a speed varying from 3 to 5 miles an hour. The total weight of the motor is 4000 pounds.

In the two-rail system on the Finow Canal a Koettgen electric locomotive runs on tracks laid on cement blocks, with the ordinary wooden ties above. This type of locomotive hauls three loaded barges 3 miles an hour, with a total load of 700,000 pounds. This method of canal haulage has been tried long enough to give some definite figures concerning the cost of work. Based upon a total annual traffic of 10,000,000 tons, the cost of electric haulage is estimated as low as 0.0029 cent per ton mile. Under steam power, with similar conditions, the cost is placed as high as 0.0042 cent per ton mile. On a smaller annual traffic the cost is higher. The difference between these figures and those obtained from old methods of canal haulage is so great that electric canal haulage cannot long be delayed on any of the first-class canals of the world.

On nearly all of the small important canals of Europe this is already the case, and the different systems employed merely indicate that engineers are approaching the question from different standpoints, but with the same object in view. On the Burgundy Canal, for instance, an electric tricycle type of engine is used which is operated along the tow path without the use of rails. This tricycle is run by a 6-kw. motor, which receives the current from suspended trolley wires. The tricycle locomotive weighs about 4000 pounds, and tows several canal boats at a speed of less than 1½ miles an hour, each boat loaded with 700 tons cargo.

Character of Equipment.

It will be noticed that in the different methods of canal haulage the tendency is to adopt rails, with heavier locomotives and greater speed, while the older method of running locomotives on the tow path is gradually being abandoned. They are slower in operation, clumsier to handle, and not so efficient. The cost of equipment is naturally smaller where no rails are used, and on very small and unimportant canals they may continue in use for years; but on canals where the future traffic is bound to be heavy the locomotives which run on trolley tracks are steadily coming into more general use. A comparison between the two distinct systems of haulage will furthermore show that the two-rail method is more economical in proportion to the amount of investment made.

In the Ganz system of a mono-rail track, the cost of equipment is placed somewhere between that for a two-rail and no-rail system. The first cost of construction is always such a serious matter that anything which cuts down the equipment appeals with great force to many. In the Ganz mono-rail system the locomotives are also cheaper and lighter in construction; but in spite of this an excellent showing as to working cost per ton is obtained. In this system there is a special wheel which runs on the tow path itself, and the path constructed for it must be kept level and hard on the surface. The proportional stability of this form of locomotive is not so good as the other type. Most of the weight of the locomotive must rest upon the wheels on the rail, and the third wheel is used more to balance the locomotive and keep it in position. The current is directed to the motor either by overhead trolley or by flexible cable. In either case the rail is used as the third conductor.

In England an aërial railway which will not interfere with the use of horses has been adopted; but this system is not likely to grow to any considerable extent,

for the heavy equipment of a canal with electric haulage devices should hardly require any auxiliary power from horses. Unless the electric system is going to prove satisfactory and continuous in operation it will hardly attract attention. In the English aërial system two steel rails are placed together at one side to form a rigid girder. They are located sufficiently high above the tow path to admit horses under them. Wooden posts support the rails, with cast iron brackets placed 20 to 30 feet apart. Small locomotives run on this high track, having four wheels each, and constructed so that they cannot be derailed by any ordinary accident. The two upper wheels run on the top surface of the rails, and the under two press against the lower surface. This type of locomotive must of necessity be small and of comparatively light weight.

This system has several advantages, one of which is that the motor is controlled from the canal boat, and no other operator is required than the pilot on the barge. The locomotive, however, cannot have great tractive power on account of its size and weight. To tow a barge of 100 tons 2½ miles by this system a tractive force of 250 to 300 pounds is needed. The small aërial locomotive can pass bridges and tunnels without any delays, and horse towage from underneath is not interfered with. The cost of haulage has been found much less than by horses. According to the estimates on the English canals, the difference between horse and aërial electric haulage is nearly one-half. Where the total abolition of horses for canal haulage has not been definitely decided upon this unit system of electric haulage is of great service. While fleets of barges cannot be towed in this way, single or several empty boats can be handled at a maximum of cost and trouble.

Italian Discrimination Against American Tool Steel.

According to information furnished to the Department of Commerce and Labor, an interesting question has been raised in Italy relative to the rate of duty on American tool steel. The bars of tool steel are sent to Italy with a slight coating of cheap varnish to prevent them from rusting on the sea voyage, and the Italian officials decided that this application of varnish was an advanced state of manufacture. The duty was therefore increased from 6 francs ($1.16) to more than 12 francs ($2.32) per 100 kg. (220.46 pounds), while English and German bars, not so varnished, were admitted at the usual rates.

J. C. Gutmann of Genoa, representing the Crucible Steel Company of America, states that up to July of last year all tool steel, whatever was its exterior, paid $1.16 per 100 kg., and large quantities of American steel were passed through the Italian custom houses without the least difficulty arising. Since that time, however, the custom house officials have been discovering reasons for putting American steel in the highest possible class. They claim that the varnish increases the value of the merchandise, although they have been informed that the anti-rust preparation disappears upon contact with fire and is not a varnish in the sense of the definitions of the customs list. The increase in the duty is so considerable that many kinds of steel are excluded from further importation into Italy. The matter is therefore one of considerable importance to all American exporters of tool steel.

A company has been organized to erect and operate the Ferris Wheel during the St. Louis Exposition, and the engineering work of the taking down, transportation and erection of the wheel has been intrusted to Robert W. Hunt & Co. of Chicago. It is estimated that it will involve an outlay of about $125,000. This work will be under the direction of L. V. Rice, who superintended the original erection of the wheel at the Columbian World's Fair, its subsequent taking down and removal and re-erection upon its present site in North Chicago. As this will be the only structure from which the whole Louisiana Exposition can be viewed, and as there will not be any towers or any other high novelties to compete with, it is believed that it will repeat its World's Fair success.

Steel for Third Rails.

At the meeting of the American Institute of Mining Engineers J. A. Capp of the General Electric Company of Schenectady, N. Y., read a paper on "Tests of Steel for Electric Conductivity, with Special Reference to Conductor Rails," in the course of which he made the following statements based on elaborate experimental work:

What is required is sufficient surface for the collection of the powerful current and an ample cross section to carry the current without an undue drop in potential. On the other hand the strength of the section is of little moment, and any section which is easily installed in an insulator is satisfactory. This permits the use of sections, rectangular or nearly so, which may be rolled easily in many mills. With these facts in mind a section of a conductor rail has been designed by W. B. Potter which, when 2.5 inches wide by 4 inches high, will weigh about 98 pounds to the yard. This shape may be easily rolled in any merchant bar mill heavy enough to attempt sections of this weight. A dovetail at the bottom provides an easy means of securing the rails by fish plates of special forms, and any of the common forms of bond may easily be applied. Ordered in lots of a thousand tons or more, such a rail should cost no more than a plain rectangle of equal weight.

From the elaborate tests on the influence of special additions to steel upon its electric conductivity it appears that manganese preponderates in influencing the resistance of the steel, and that for lowest resistance manganese must be present in very small quantities, much smaller than is usual in merchant steel or structural steel. While all the elements must be present only in very small percentages, so great is the preponderance in the influence of manganese that other elements may be tolerated in quantities which the steel makers would consider reasonable without unduly increasing the resistance.

For a satisfactory third rail the lowest possible resistance (say, from 6 to 6.5 times that of copper) is not necessary, and the great cost of making such extremely pure steel is not warranted. In fact, such extremely pure steels would probably be so soft that the frictional wear of the collecting shoe would be excessive and the life of the rail in service unduly short. Assuming, then, that a rail made from steel having a resistance not greater than eight times that of copper (13.8 microhms at 20 degrees C.) would be desirable for conductor rails, the figures tabulated would seem to indicate that the following extreme composition would be permissible:

	Per cent.
Carbon up to	0.2
Manganese up to	0.4
Phosphorus up to	0.06
Sulphur up to	0.06
Silicon up to	0.05

This composition, however, would be extreme, and any overstepping of bounds might result in too great resistance; therefore, for resistance up to eight times that of copper, the specified analysis should be:

	Per cent.
Carbon not to exceed	0.15
Manganese not to exceed	0.30
Phosphorus not to exceed	0.06
Sulphur not to exceed	0.06
Silicon not to exceed	0.05

This latter composition is one which could be made easily in any open hearth furnace, and it should present no difficulty in rolling to a shape suitable for conductor rails. In fact, steel of this composition has been successfully rolled into sheets as thin as 0.014 inches, a size, which was for a long time a standard product of a large sheet mill.

Mr. Capp added some remarks concerning wear and tear of such conductor rails, and from what he said it appears that this is a very serious question. While he did not give the exact figures, he said that the wear and tear of the third rail of the Manhattan Railroad has been about 1-10 inch since the time of its installation.

Canadian News.

Bounty Fostered Steel and Countervailing Duties.

[The position of the United States Treasury Department with regard to duties on Canadian steel was set forth in an editorial paragraph in our last issue. Under existing laws no danger is apparent of countervailing duties to equal the Canadian bounty being imposed. Nevertheless, the intimation of such a possibility has caused some excitement in Canadian manufacturing circles, and the following letter from our regular correspondent will be found especially interesting.—THE EDITOR.]

TORONTO, October 24, 1903.—The suggestion that countervailing customs duties be applied by the United States to imports of pig iron and steel on which Canadian bounties have been paid is, of course, not welcome to the Canadian exporters of these commodities. If such duties were imposed they would close what is now the chief market of the largest iron and steel producing company in Canada, for up to the present most of the output of the Dominion Iron & Steel Company has gone to the United States. That market is already much duller and less profitable than it was a year ago, and the proposal to put on countervailing duties is one of the indications of its state of comparative decline. When the consumption of iron and steel was at the high point there was no demand for a make weight upon Canadian products, for the needs of consumers were practically insatiable, and American producers who were overwhelmed with orders at high prices could not be benefited by the exclusion of foreign iron. But now when consumption has fallen off sharply, with production but moderately curtailed, and prices dropping—conditions in themselves telling on the returns from Canadian sales in the United States—the barring out of Canadian pig iron and billets would be of perceptible advantage to producers in the northeastern section of the United States. It would also press on the immediate attention of the Canadian interests now dependent on United States consumers of steel a problem that had before seemed to belong to the future—namely, How should they dispose of their output? An extra American duty, equivalent to the bounties, would completely shut the doors of the United States market. At present the bounty on Canadian pig iron produced from Newfoundland ore is $1.60 a ton. On the steel billets made from that pig iron there is a bounty of another $1.60 a ton. Hence the total subsidy from the Government is $3.20 a ton on steel billets that are the secondary product of Newfoundland ore. A countervailing duty, it is to be supposed, would be at the same rate. Three dollars and twenty cents added to the present Dingley duty on Canadian steel billets would prohibit their importation into the United States.

Home Opposition to Exports of Bounty Fostered Steel.

It has long been foreseen that the United States market might cease to be remunerative for Canadian producers. Also there has been a popular feeling, however much or little producers of crude steel may have shared it, that foreigners ought not to get the benefit of the million dollars or so paid out of the public treasury to aid the production of pig iron and steel. Thus both the interests of Canadian steel producers and of the Canadian people moved toward the manufacture of the output of the furnaces into finished products such as were being imported from the United States, Germany, Belgium and the United Kingdom. Instead of selling bounty aided billets and importing rails, plates, &c., it appeared on all hands to be desirable to roll the billets into the rails and other finished products for sale in this market. As the exportation of billets seemed likely to be rendered impracticable, it was considered by many that the importation of rolled products should be stopped by the imposition of protective duties.

Accordingly representations in favor of such duties were made to the Government. The result was not up to the expectations of the steel interests nor fully up to the disposition of the public, for the duty on steel rails was made so conditional as to be almost denied, and the aid to the production of steel plates, beams, angles, girders and wire rods was given in the form of bounties instead of duties. Joined to this disappointing provision of the Government was the difficulty of getting capital for the erection and equipment of plants to carry on the manufacturing processes beyond the bloom or billet stage. Had the Government granted positive and adequate protective duties, possibly there would have been more readiness on the part of capital to embark in rolling mill enterprises. It would seem, therefore, as if the situation of the Canadian steel industry would be one calling for some consideration by the Government should the unfavorable conditions be increased by American countervailing duties.

Besides further embarrassing existing industries on this side of the line, such duties would tend to hurt in their inception industries at present being promoted. Projected steel works on the Welland Canal and on the St. Lawrence would not be more warmly received by investors if the United States market were closed to the crude products of Canada, while this market remained open to the finished products of the United States. There would undoubtedly be a strong demand for Canadian retaliation, a demand which the Government might be moved by irritation, not less than by regard for Canadian industrial interests, to satisfy.

A Bit of History Concerning Bounties.

When the Canadian Bounty bill of 1897 was before the house the question whether the aid should or should not be restricted to pig iron and billets consumed at home was discussed. It was the original intention of the Finance Minister, Mr. Fielding, to limit the bounties to the products used at home. Geo. E. Foster, ex-Minister of Finance, urged their application to all the output of the furnaces, no matter in what market disposed of, and his advice was finally followed. As both Ministerial and Opposition members supported this extension of the bounty system, it has never been criticised from a party point of view, but newspapers conducted in the interests of farmers have been steady objectors to the policy of assisting foreign industry by bounties to cheapen the cost to them of their raw material. Like objections have continuously been made by the advocates of free trade, who can hardly now be said to be within the lines of either party.

On the subject of protection William McMaster, vice-president and general manager of the Montreal Rolling Mills Company, recently stated in an interview that the output of the various Canadian works will this year be much greater than ever before. He did not see any reason why trade here should be affected by depression in the United States. From a purely business standpoint, however, and irrespective of politics, he considered there was need of a revision of the tariff for protection. His own company, he said, intend to construct a new wire nail plant, with an output of 100,000 kegs a year, and to extend their mills to twice their present capacity.

Government's Rail Contract with the Sault Works.

The contract between the Government of Canada and the Algoma Steel Company (one of the constituent concerns of the Lake Superior Consolidated Company) for the supply of rails for the Intercolonial Railway was referred to in the House of Commons some days ago in a discussion of the estimates. A re-vote of $780,000 for steel rails and fastenings was the item that brought the matter forward. Mr. Fielding informed the house that 5700 tons of rails had been delivered by the Clergue Company out of 10,000 tons that the company expected to supply. All the rails now offered had been taken by the Government. In the main, they had been found good, and the company had given a five-year guarantee. Mr. Fielding added that he now regarded the contract as practically at an end, owing to the company's failure to perform it fully. At the same time, he intimated, the Government would be glad to encourage Canadian mills when satisfactory rails could be obtained from these.

The Sault contract, it may be remembered, called for the delivery of 25,000 tons of rails, to be delivered within 1901, the price to be $32. It further provided that the company might supply 25,000 tons per annum for four years more, the price to be the equivalent to that at the time current in the British market. C. A. C. J.

The Knox Steel Railroad Tie.

At the quarterly meeting of the Board of Directors of the Salisbury Steel & Iron Company, held in the offices of the company, Utica, N. Y., last week, negotiations were consummated with O. M. Knox, the inventor and patentee of the Knox steel railroad tie, by which all of the patents and rights covering the Knox design are assigned to the Salisbury Company.

Steel railroad ties have been receiving consideration from railway officials for several years, as it is conceded that the rapidly decreasing supply of wooden ties will cause the general adoption in the very near future of ties made from some material other than wood. Experiments have been made with compressed leather and a modified form of glass, molded into oblong forms, and even reinforced cement ties have been considered. It is the general opinion, however, that the coming railroad tie will be made of steel.

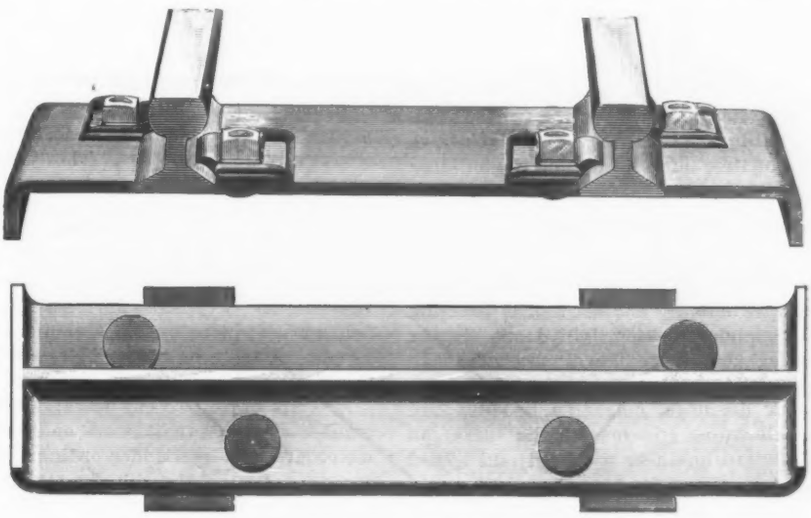
This field holds out strong inducements to the inventor, and in the past 15 years it would seem that the Patent Office has been called upon to pass on almost every conceivable form made from iron or steel that could be used for a railroad tie. The great objection to steel ties is their apparent lack of elasticity, causing much more wear and tear on the rolling stock than wooden ties. To overcome this has been the aim of all steel tie designers. One inventor used a set of heavy springs under his tie. Another made his tie in the shape of a spring, and succeeded in securing an order for 18,000 of them from one of the largest railway systems in the country. In actual use, however, they were an utter failure because of too much flexibility.

Steel ties have been used for some time by the Bessemer & Lake Erie Railroad, owned by the United States Steel Corporation, with satisfactory results. The Lake Shore road about a year ago installed a section of track on the Sandusky Division with steel ties, and tney have given very good satisfaction under most trying conditions.

The Knox tie, an illustration of which appears herewith, is claimed to have none of the objectionable features of other steel ties, and has several decided advantages. This tie, which is very simple in design, is about 10 inches wide, 8 feet long and ⅝ inch thick. The central flange and ends, on the under side, are 4 inches deep and of the same thickness as the top. The holes for the bolt clips are square and are placed so that they will fit a track of any gauge. Among its advantages are mentioned the ease with which it can be tamped from either side; the central flange and ends act as anchors, preventing the tie sliding in any direction on the roadbed; no rail can spread or get loose; the central flange stiffens the upper plate sufficiently for the heaviest loads, yet it has the same ductility as a wooden tie; because of the increased strength and durability engineers state that it will require only three Knox ties to replace five wooden ties. Railroad officials state that the Knox tie should last at least 20 to 25 years, judging from the success attained in Germany and Switzerland with a steel tie of similar design, whereas wooden ties last only six to seven years on main line track.

The Salisbury Steel & Iron Company were incorporated in November, 1902, under the laws of New York, with a capital of $1,000,000. The company have acquired by outright purchase about 520 acres of ore lands in Salisbury Township, Herkimer County, N. Y., and during the past year have been sinking shafts at different stations on the property. The ore, which is a very high grade magnetite, occurs in the contact of granitic gneisses and limestone, and outcrops on the property for over 6000 feet. In shaft No. 2 the vein at the outcrop measured only 22 inches wide, but at 90 feet this increased in width to 14 feet, the analysis of the ore increasing from 58 to 63 per cent., decreasing in sulphur and phosphorus, and free from titanium. Work has just been completed upon a new shaft house, and a new boiler house is now in course of erection.

The Salisbury Company propose to install a complete drilling, grinding, crushing and concentrating plant, to be run by electricity, and bring the ore up to the highest percentage of metallic iron possible. By concentrating the ore, the metallic iron is increased to 68 per cent, while the sulphur, which occurs in the form of small grains of pyrites, and the phosphorus, carried in grains and laminæ of apatite, are readily removed, resulting in concentrates of the highest quality. These concentrates are then to be reduced by the Ruthenburg process of electrical reduction, resulting in a very high grade melting stock for open hearth furnaces. An open hearth plant is to be erected either at the Salisbury mines or at Utica, using this melting stock, which is particularly adapted to the purpose, for the manufacture of steel ties.



THE KNOX STEEL RAILROAD TIE.

It is estimated there are 11,000,000 tons of ore in sight on the Salisbury Company's properties, and with their own ore and the Ruthenburg processes, which have been demonstrated to be a commercial success, the Salisbury Company will be in a position to produce steel ties at the lowest possible cost. Work is now being pushed on the sites for the new plants, and the company are striving for the honor of being the first to make steel by electricity on a commercial basis, and also the first to place a practical steel tie on the market.

Chicago and other Western cities now forbid the use of wooden advertising sign boards and bill boards, and as a consequence the bill posting companies are large buyers of galvanized sheets. For bill boards that are secured to dead walls 28 and 29 gauge sheets are customarily used, while 16 to 14 gauge is used for signs with unsupported backs.

Naval Construction in 1903.

Annual Report of Chief Constructor Bowles.

WASHINGTON, D. C., October 27, 1903.—The annual report of Rear-Admiral F. T. Bowles, chief of the Bureau of Construction and Repair, has been submitted to the Secretary of the Navy. Among the subjects treated by the Chief Constructor are the strikes and financial trouble of contractors, which have resulted in delays in the delivery of vessels; the preparation of standard plans of ship fittings in co-operation with private shipbuilders; a large amount of interesting experimental work conducted by the bureau during the year, both for the Government and for private parties; and the necessity for additional dry docks to facilitate repairs to battle ships and armored cruisers. Following is an advance abstract of the report:

While the additions to the effective force of the navy by the completion of vessels building under contract and by transfers from other departments of the Government are considerable in number and value to the navy, they are by no means as great as should have been made in the period since the date of the last annual report. They consist of the battle ship "Maine," the four monitors "Arkansas," "Nevada," "Florida" and "Wyoming," 12 destroyers, one torpedo boat and seven submarine boats. This list should have been increased by two battle ships (the "Missouri" and "Ohio"), whose completion was delayed by the nondelivery of armor and by strikes, and by the five cruisers of the "Denver" class, whose completion is expected within a few months, but which have dragged out a length of time unnecessary for the building of small cruisers.

Standardization of Fittings.

The bureau has considered the preparation and issue of standard plans of ship fitting in co-operation with private shipbuilders. Plans have been issued covering hinges and pads for standard water tight doors, rigging screws, screw steering gear, wire hawser reel, &c. In addition, type plans, with specifications, have been prepared and issued for drainage, magazine flooding, fire system, fresh and salt water systems for the 16,000-ton battle ships. The bureau has also prepared and issued a set of standard specifications for plumbing fixtures, in order that these fittings may be of a uniform type and quality, with the least practicable weight and cost consistent with reliable service. It is believed that these specifications will result in considerable economy of cost and weight.

After most thorough investigation in consultation with different private shipbuilders the bureau has issued a standard sheet of instructions in regard to sizes, fastenings and method of fitting pipe flanges for all drainage work on board naval vessels. Great diversity of practice obtained in this matter and resulted in a considerable increase in the cost of overhauling and repairs to vessels in the service, and great difficulty in maintaining a stock of the fittings and material necessary for purposes of maintenance in the navy yards and on board ship. The bureau has issued revised general specifications for electrical appliances under its cognizance on shipboard, and also for electric conductors for use in its work in navy yards.

Experimental Work.

The experimental model basin has continued in successful operation during the year, experiments of one kind or another having been made with nearly 150 models of all kinds during that time, including five for private persons. The experimental model basin has now become indispensable to the bureau in connection with work upon new designs, particularly those involving novel features. The final forms for the 1000-ton gun boats and the 13,000-ton battle ships authorized during the last session of Congress were adopted only after a number of experiments, with the view of obtaining the most desirable form in each case. The results in the case of the 13,000-ton battle ships illustrate clearly the value of the experimental model basin. As the result of a succession of experiments with the final form adopted for these vessels, a speed of 17 knots can be confidently anticipated with but 10,000 indicated horse-power.

There are five completed battle ships in the navy of 11,500 tons displacement and but 7 feet shorter than the "Idaho," or 13,000-ton class, which averaged on trial almost exactly 17 knots with 12,000 indicated horse-power. The new ships, although of 1500 tons, or 13 per cent., greater displacement, will attain this speed with 2000, or 16 2-3 per cent., less horse-power, and if they reach on trial the same efficiency of propulsion as obtained by the best of the 11,500-ton ships will appreciably exceed the 17-knot speed.

Progressive speed trials of completed vessels are the essential complement of the investigations of the model basin in order to determine the efficiency of propulsion. Up to last year, of the large number of vessels built for the navy in the last 20 years only the "Chicago," "Boston" and "Yorktown" had thorough progressive trials in commission. At the urgent request of the bureau, and with the cordial co-operation of the Bureau of Steam Engineering, such trials have been made of the battle ships "Alabama," "Massachusetts" and "Kearsarge," and in the past year progressive trials for speed and coal endurance have been made of the destroyer "Truxton." The bureau will continue to urge that all types of ships be subjected to progressive trials, as the scarcity of reliable data of this kind has been a serious handicap to successful naval design.

Extension of Electrical Application.

During the last few years the ventilation of naval vessels has been obtained almost entirely by the use of electrically actuated fans. These have many advantages in practical operation over steam driven fans. There was great lack of information, however, as to the real efficiency and delivery of the fans hitherto installed. Using apparatus especially designed for this purpose, the bureau has caused comprehensive experiments to be made at the Washington Navy Yard during the last year upon the efficiency of fans of various commercial makes, and has supplemented these by special experiments upon ventilation systems installed upon the "Missouri."

On all of the recent naval vessels of importance a number of water tight doors and hatches, some or all of which are left open under ordinary conditions, but must, for the safety of the ship, be closed promptly in case of accident, have been fitted with mechanical appliances for controlling them and closing them from a distance as well as on the spot. Pneumatic appliances have been fitted upon nearly all doors in the service, but the bureau has been anxious for some time to extend the use of electricity to these fittings, provided reliable electrical apparatus could be developed. With this end in view, it had tests made during the year at the Washington Navy Yard of several types of electrically operated water tight doors with distant control, the doors and operating devices being tested for endurance as well as water tightness. Types of electrically operated horizontal sliding doors and hatches have not yet been approved, but experiments are still in progress, and it is expected that satisfactory fittings will be determined upon in the near future.

The bureau has investigated existing types of electrical steering gear with a view to its use upon naval vessels, and has designed and purchased the material necessary for the installation of electrical steering apparatus on the monitor "Nevada." The results of the trials of this steering gear when completed will, it is hoped, furnish ground for its further extension in the service. The importance of the absolute reliability of the steering gear of vessels renders it necessary, in the opinion of the bureau, to proceed in this matter with extreme caution.

Dry Docks.

The bureau's work continues to be embarrassed by lack of sufficient dry docks of capacity suited to the dimensions of battle ships and first-class armored cruisers. On the Atlantic Coast there is but one dry dock (that numbered 3 at the navy yard, Brooklyn, N. Y.) which is of sufficient size to take all the vessels at their regular cruising draft. Dry dock No. 2 at that yard takes the majority of battle ships now afloat. This condition of

affairs makes it impossible to efficiently distribute the docking and current repairs of the fleet among the different navy yards, so as to carry on the work expeditiously and economically.

Steel Inspection.

The quantity of ship steel inspected by the bureau and the amount passed and shipped for incorporation into naval vessels shows an increase over the figures of the preceding year. The total quantity submitted for inspection under the bureau's requirements during the fiscal year ending June 30, 1903, was 250,720,754 pounds, as compared with a total of about 212,242,000 pounds for the fiscal year ended June 30, 1902. Of the total amount inspected 12,612,627 pounds were rejected on physical tests, 2,412,282 pounds on chemical defects and 51,279,208 pounds for surface defects, making a total of 66,304,117 pounds, or 26.4 per cent., rejected for all causes. The scrap amounted to 35,360,039 pounds, leaving 149,056,598 pounds of finished material accepted and shipped.

W. L. C.

Lake Ore Matters.

DULUTH, MINN., October 24, 1903.—The season of iron ore shipments is closing just about as anticipated by this correspondence, and ships of the biggest ore carrying fleet are already going into winter quarters. A few vessels are tied up here now, and others of the Pittsburgh Steamship Company's barges will be stripped as they arrive here. The steam vessels are to continue a little longer. The docks of the Duluth, Missabe & Northern have passed the 5,000,000-ton point and are about 300,000 tons ahead of last year at this time, but at no other port is this year's record up to that of the corresponding time a year ago. Stock pile shipments are large from some old range points, and it is the desire to clean as much ore from the surface as possible before the winter closes in. There is a little better demand for some grades of ore, and some sales have been made that require additional shipments this fall. The extreme pessimistic feeling that has pervaded some circles is lifting slightly, and a fairly good business for the winter is looked for in most of the lake region.

Curtailment of Mining Operations.

Considering the number of men dropped from mine and other pay rolls in the past few weeks, the constant demand for labor and the continuance of high wages in this district are a little surprising. The winter logging season is coming on, and with it the usual demand for labor in the woods, but there seems to be no oversupply, and the high wages of last year are still demanded and, in most cases, are paid. Lumbermen had expected to hire crews for the woods for 25 per cent. less than a year ago.

At Chapin and Aragon, the United States Steel Corporation's largest Menominee range mines, a curtailment of operations will be gradually effected by the discharge of a portion of the unmarried men now on the payrolls. There are about 1000 men at the former and 900 at the latter, and about 400 will be dropped at the two mines in the course of a few weeks. All mines of the Schlesinger syndicate, on the Gogebic range, have given notice of a reduction in force, which cuts out some 200 employees. The Oliver Iron Mining Company's new shaft north of Davis mine, east of Ironwood, has been closed temporarily, letting out 25 men. Little else in the way of disturbances of the prevailing order of things has occurred this week. Of course it is generally accepted along the ranges and by miners that this curtailment of force portends a reduction of wages, but as the men have shared the general advance they are not especially unwilling to share the decline, and, generally speaking, they are in excellent position to stand reduction without serious discomfort.

Closing of Options and New Explorations.

The Minnesota Iron Company have closed an option taken some months ago for the south half of Section 36, T. 59, R. 18., northeast from the Mountain Iron mine, for $50,000. The company explored the property under their option and found some 3,000,000 tons of good ore, all under a heavy capping of rock. This land had been explored several times unsuccessfully, which was the cause of the low price of the present option. It is a State lease, and the school funds of Minnesota will receive from the mine not less than $750,000. There is no probability of mining there for some time. Daniels & Spelman, who own the fee to a part of Section 6, T. 58, R. 15, which was explored and abandoned by the Minnesota Iron Company, have now made a lease to the Century Mining Company on the basis of 20 cents royalty and an advance payment of $15,000. They have some 800,000 tons of hard Bessemer ore in sight, but the Minnesota Iron Company abandoned the option on account of the large payments they were asked to make and the difficulty of mining the deposit, which is not only small but is probably very wet.

It is considered doubtful if the Standard Mining Company (W. P. Snyder and associates) take the Arcturus mine, Western Mesaba range, under their option for lease. They have spent nearly $50,000 in experimenting in concentrating its sandy ores by a washing process, and though the experiments are said to have been successful it is possible they have been rather more costly than was anticipated. The mine lies 15 miles from the nearest railway point, and the cost of merely assembling the heavy machinery required—washers, screens, agitators, half a dozen boilers, big pumps, &c.—must have been comparatively large.

Work on the Western Mesaba is quieter than since that part of the range received its first serious attention two years ago. All of the amateur explorations have ceased, and those that are still active are conducted by experienced men. The crowd noticeable there a year or so ago is gone. Success has not crowned the efforts of many of those working in the region, and most of the ore bodies found have been either lean or quite too sandy to be at present valuable without concentration.

Mines Ceasing Shipments.

Winnifred, Laura, Howe, Kanawha, Jordan and Commodore mines of the Mesaba range have ceased shipments for the year. They are all small. Jordan was the largest shipper, and its total for the year was but 190,000 tons. Laura was next in importance, and mined 87,000 tons. Kanawha is exhausted and is closed permanently. Hale mine, adjoining Kanawha, and which was abandoned by the Colonial Mining Company last year, is to be reentered and explored by J. P. Morrow and associates. About 200,000 tons were left in sight by the former lessees and exploration for extensions to the ore body was never undertaken. No. 1 shaft at Clark mine will be abandoned and the head frame is to be moved to new shaft No. 3.

It is rumored that the Chicago & Northwestern ore docks at Ashland, Wis., handling the bulk of Gogebic range product, will be lengthened 500 feet the coming winter, making them 1900 feet long, and increasing their capacity about 20,000 tons.

D. E. W.

An ordinance has been introduced into the Chicago City Council to compel owners of plants employing electric machinery to take out licenses, the annual fee being $10 for the chief electrical engineer and $1 for each man who operates electric machinery. The ordinance provides for the examination of applicants by a board of three electric examiners, each of whom is to be paid $5 a day for his services. Owners of electric machinery are also required to give bond in the sum of $1000 to indemnify the city against loss owing to accidents or other causes. This ordinance is being opposed by the leading manufacturer of electric machinery on the ground that it involves unnecessary annoyance and expense to firms using electric power.

The first annual meeting of the Manufacturers' Association of Pittsburgh was held in their offices in the Lewis Block, in that city, last week. Officers for the ensuing year were re-elected as follows: George Mesta, president; I. W. Frank, vice-president; Joseph A. Speer, treasurer; F. H. Zimmers, secretary; Executive Committee, W. H. McFadden, John Jackson, G. E. Brush and Stewart Johnson.

Electricity and Water Powers.

At the recent meeting of the New England Cotton Manufacturers' Association F. A. C. Perrine of Pittsfield, Mass., presented a paper from which we quote the following passages:

Estimating the Cost of Power.

Consulting engineers are in the habit of estimating water powers solely on the basis of the amount of power which is available for 365 days in the year, of 24 hours for each day. Perhaps they are wise in so estimating, as the mistakes they may make in underestimating the usefulness of the water power are very often counterbalanced by the mistakes they are also making in the cost of its development and the possibilities of the market. But, however advisable it may be for the consulting engineer to neglect altogether the variable power a river is capable of furnishing, it is necessary in this discussion for us to consider the limits of variability which one should allow for development of a water power. New England mills are equipped with both steam and water power, and there is probably no body of men in the country more familiar with variable water power than this. Water powers not continuous require an equivalent steam power equipment of engines, boilers and men, with full interest charges, and in consequence such powers only effect a saving equivalent to the fuel consumption of the steam engine. This, with continuous power and coal at the average New England price, amounts to approximately $36 per year, and in consequence it is not reasonable to contemplate the development of excess power beyond the continuous flow of the stream where the generation of the excess power involves capital and operation charges exceeding $36 per year. Furthermore, I do not consider that it is safe to estimate that this means that one should expend as much as $600 per horse-power for the development of excess power. In fact, it is my opinion that it is unwise to develop the variable power of a river where the expenditure for this portion of the developing exceeds, on the basis of 12 months' supply of power, $200 per horse-power, or, in other words, $100 per horse-power for six months' power or about $150 per horse-power for nine months' power. I am confidently of the opinion that it is economical to develop the variable power where the continuous power does not exceed in cost $300 per horse-power and the variable power does not exceed $200 per horse-power, based upon a continuous rate.

A statement has been made, and I believe that such a statement is hard to disprove, that the development for continuous power at a cost not exceeding $300 per horse-power produces energy at a rate with which steam plants cannot compete successfully, no matter what the cost of fuel, and I am further of the opinion that where the excess power for a development does not cost more than $200 per horse-power it more than pays for the saving in fuel alone, and that this condition warrants the development of this excess power and the installation of a steam plant to be operated only during the time of the deficiency of water. As these opinions may not be easily justified in the installation of the plants having less than 1000 horse-power minimum capacity, and as the majority of mills and water powers to which the argument might apply are of less capacity than this, it may, at first sight, seem that the arguments which have been presented have no particular or general interest.

Certainly it is true that cotton mills have been built up along the water powers of New England, but as a consequence we find everywhere wasteful and expensive development of power, a lack of proper railroad facilities and a general disregard for manufacturing convenience in consequence of a choice of site rendered necessary by the domination of the needs of past methods of water power development. The idea that I would bring forward is that of the centralized plant, developing power for the use of many cotton mills, as I believe that the manufacture of the power should not be considered one of the provinces of the cotton mill superintendent. In many cases this means the purchase of power from an altogether independent concern from the mill itself, though in many cases I hope in the future to see central power plants owned by the cotton mills, precisely as they own their insurance companies to-day, with a separate and efficient management and with a common interest and aim.

Development in Large Units Advocated.

It may be seen, then, that what I am intending to advocate is the complete development of the water powers in large units and not in small units, with auxiliary central steam plants, permitting at all times the distribution of constant power to the mills and the consequent location of the mills in reference to their product and operatives, and not in reference to the power. In order to do this it is necessary to abandon the contemplation of small developments of individual falls, and to substitute therefor the unification of many falls into one high head power wherever this can be accomplished by the means of flumes or dams. Whether this shall be done by the individual mills or a separate water power company owned by the mills is a question for each individual case. Generally in sections thickly covered by mills and intersected by power streams there is no doubt but what the central plant can easily utilize and concentrate all powers within a radius of 35 miles, tying the auxiliary steam plants and water power plants together by transmission lines so that the mills will be free not only from the variation in the water supply but also from interruption of service due to breakdowns of machinery.

It may be objected that the opportunities for accomplishing this have most of them altogether disappeared. This, indeed, is regretfully true, but it is not altogether true; and we have to-day many streams throughout New England undeveloped on account of their fancied inaccessibility, which can readily become available if the question of the possibility of the site of the mill near the water power be considered as unimportant and if transmission distances of from 25 to 35 miles be contemplated.

The development of water powers at high heads has not only advantages on account of the fact that the inefficiency of many small wheels is eliminated, but also from the standpoint of the storage reservoir, since with the high heads that are sometimes reasonably available the quantity of water necessary to develop a large power is so much reduced that reservoirs become important which under low heads are of inconsiderable capacity.

Objections to Low Head Developments.

The disadvantage of the location of mills along the rivers is most beautifully shown in our neighboring cities of North Adams and Adams, where we will find mill after mill with foundations sunk in the river beds at a very considerable expense and where once every five or ten years great repair bills on account of floods are encountered, though the configuration of the ground is such as would have permitted the consolidation of the water powers into one large, efficient central station plant.

The most notable example that has come to my attention of the wastefulness of low head development is to be found at Holyoke, where the canals consume space which should be available for good factory sites, and where they are losing from 20 to 25 per cent. of the entire power developed by reason of the inefficiency of many low head wheels in series. I claim that it would not be correct to object that in such a case as that of Holyoke the inefficiency of electrical machinery and transmission would more than counterbalance the increased efficiency of the water wheels, since we all know that the introduction of the electrical drive will of itself overcome the loss from belting, amounting to more than the inefficiency of the electrical machinery, and whatever increased efficiency there could be gained by the high head would be clear gain and increased power.

What is here advocated, then, is the development by means of long flumes in large central power stations of as many rapidly flowing streams as are available; the development of streams that by reason of their distance from satisfactory factory sites have heretofore been considered unavailable; the increase in size of the power plants, and the uniting under one management of as many power plants as possible, as well as the operation under the same management of steam auxiliaries necessary for the delivery of constant power; the abandonment by the

cotton manufacturers, as far as is consistent with present conditions, of the generation of power as a part of their regular business and the placing of this work in the hands of experts who will install the machinery, make the power and deliver it to the mill for the operation of their dynamos; the location of the mills themselves at points adapted entirely to their manufacture, taking into account both the accessibility to railroads and the comfort and convenience of their employees.

The 13,000-ton Battle Ships.

Secretary Moody Settles Controversy as to Design.

WASHINGTON, D. C., October 27, 1903.—The Secretary of the Navy, after a delay of more than four months, during which the opinions of many of the most prominent officers of the naval service have been secured and examined with much care, has finally approved the design adopted by the Board of Construction for the two 13,000-ton vessels, "Idaho" and "Mississippi," authorized by the last Congress, with three slight modifications, the addition of two broadside submerged torpedo tubes, a reduction in the main battery of two 7-inch guns, and the increase of the main armor belt to a uniform thickness of 9 inches, instead of tapering from 9 to 7 inches.

When the original report of the board was made public in June last it was sharply assailed by Admirals Melville, chief of the Bureau of Steam Engineering, and Bradford, chief of the Bureau of Equipment, who contended that speed had been sacrificed for armament in these vessels, which, as a result, would be found to be too slow to run away from a first-class battle ship, with which however, they would not be able to cope owing to the difference in gun power and armor. In view of the criticism of the report it was finally referred back to the board, the *personnel* of which had changed in the interval by the retirement of Admiral Melville and the appointment of Admiral Rae as his successor. At the same time the Secretary of the Navy invited the opinions of nine prominent naval officers, which when received were referred to the board for consideration.

After many protracted sessions devoted to the examination of several sets of plans and much other data a majority of the board, consisting of Admirals O'Neil, chief of the Ordnance Bureau; Bowles, chief of the Bureau of Construction, and Rae, chief of the Bureau of Steam Engineering, have declared in favor of the original design with the three modifications above referred to, while Admiral Bradford has filed a minority report, in which he dissents from the views of his fellow officers. The majority have also filed a rejoinder to Admiral Bradford. In their report, which will undoubtedly have an important influence upon future legislation regarding the navy, the majority say in part:

Views of the Majority.

The board is still strongly and unanimously of the opinion that an actually first-class battle ship should have a speed of 18 knots, and in the recommendations heretofore made or herein expressed does not intend to convey that the design of the 13,000-ton battle ships represent its opinion of what first-class battle ships should be, nor what the United States Navy should have. The problem has, however, presented itself of preparing a design to meet the conditions of the law as expressed in the act of Congress of March 3, 1903.

Considering that speed is an element of power which does not always remain invariable with a ship, but is dependent upon the vessel's condition and age, and that the elements of battery and defensive armor are fixed and definite in the battle power they represent, the board concluded, with due regard to the fact that the navy already has nine battle ships of 17 knots speed and less, that the price to be paid in fighting power for one knot speed was too great, and therefore decided to recommend the 17-knot design for the vessels authorized by this act.

Admiral Bradford Dissents.

Admiral Bradford, in his minority report, emphasizes the fact that of the nine opinions submitted by officers of the navy six favored a speed of 18 or more knots. In addition he says in part:

There are two important qualities of the design now recommended by the majority of the board which I believe should receive serious consideration: (1) The relation of the speed of this design to the speeds of ships building, and (2) capacity for sea fighting. If the speed of the "Idaho" and "Mississippi" corresponds to that of the old battle ships, then they must be relegated for service to the old battle ship class, and the first line of defense, composed of battle ships of the latest and most powerful type, with a speed of 18 knots, is not strengthened. There is no doubt of the importance of increasing this first line of defense as much and as soon as possible. Should the slow "Idaho" class be added to the "Maine," "Virginia" and "Connecticut" class, then the speed of the fleet would be reduced 1½ to 2 knots. Even should this sacrifice be made, the "Idaho" class would still be useless in a moderate seaway, owing to low freeboard.

The Board's Rejoinder.

In their rejoinder to Admiral Bradford's criticisms, the majority assert that the statement that the "Idaho" class would be useless in a moderate seaway, owing to dow freeboard, is not justified by the facts, and call attention to the fact that the freeboard of the "Idaho" forward is the same as that of the "Virginia" class. Concerning Admiral Bradford's contention that the low speed to be given the new vessels will handicap any fleet to which they may be attached, the majority say:

As much stress is laid upon the importance of homogeneity of the vessels of a fleet, especially in the matter of speed, and while such an element is without doubt of great importance and much to be desired, it should be remembered that speed is the most fluctuating quality a vessel possesses, being largely a matter of condition, depending upon draft, trim, condition of the vessel's bottom, condition of her boilers, quality of coal and the efficiency of the engine and fire room forces. Therefore in vessels of exactly the same class there will always be a very appreciable difference in speed, depending upon their respective condition.

The case of the "Oregon" and "Indiana" during the Spanish-American war illustrates in a forcible manner what may happen to vessels of similar type, built at the same time; the "Oregon" being several knots faster than the "Indiana" at the battle of Santiago de Cuba, due to the difference in condition of the boilers and bottoms of the respective vessels.

These arguments are not intended to show that high speed is not desirable, but are intended to show that homogeneity of speed, at the higher rates of speed, is a condition exceedingly difficult, if not impracticable, of fulfillment. Armor and armament remain constant, and homogeneity with respect to speed can only be expected at moderate rates of speed, never at the maximum speed for which the vessels were designed.

In approving the majority report Secretary Moody makes it entirely clear that he does not regard the 13,000-ton battle ship as a desirable type, but that he believes the design of the Board on Construction is the best that can be produced within the limitations set by Congress.

W. L. C.

Machine for Driving Screw Railroad Spikes.

Under the direction of the Bureau of Forestry, a machine for driving screw spikes into railroad ties has been designed at the Worcester Polytechnic Institute, Worcester, Mass., by Prof. A. L. Smith. The machine is set on the rails, the spike is then screwed into the tie by a simple crank movement, and the machine, without being removed from the track, is pushed along the railroad until it is in place for fastening the spike in the next tie. In this way the spikes can be set and screwed with great rapidity and with the expenditure of a minimum amount of labor. Two of the machines have been made at the Washburn Shops, which are conducted by the institute. One was for the Pennsylvania Railroad and one for the New York Central. The screw spike is a form of spike which has been employed in France and Belgium for many years. The advantage which this spike has over the ordinary form of spike lies in the fact that the holding power of the screw is practically independent of the resiliency of the wood fiber. In other words, the screw spikes hold the rails to the tie with great firmness and prevent the pounding action, which is so common with the ordinary spikes. It is claimed that with the screw spike substituted for the ordinary spike, there will be no reason why beech, birch, hemlock and other soft timbers cannot be used with great freedom by railroad companies in place of white oak and chestnut, which are now so extensively employed. The screw spike would also avoid the splitting of the ties, which results in greater or less degree from the driving of the ordinary spike. Some 15 of the trunk railroads have agreed to test the screw spikes on a considerable scale to determine the feasibility

of introducing them as fast as practicable throughout their systems.

The Baker Double Spindle Boring Machine.

The illustrations show two types of a heavy double spindle boring machine designed for such work as that of boring locomotive connecting rods, as well as for all heavy facing and counterboring operations. This machine is really a combination of two boring machines mounted upon one base. The bed plate is very massive, and has a working table 11 feet 2 inches long and 24 inches wide inside the oil grooves. The interior of the table forms an oil tank from which lubricant is supplied to the cutting tools, each spindle being provided with a separate pump.

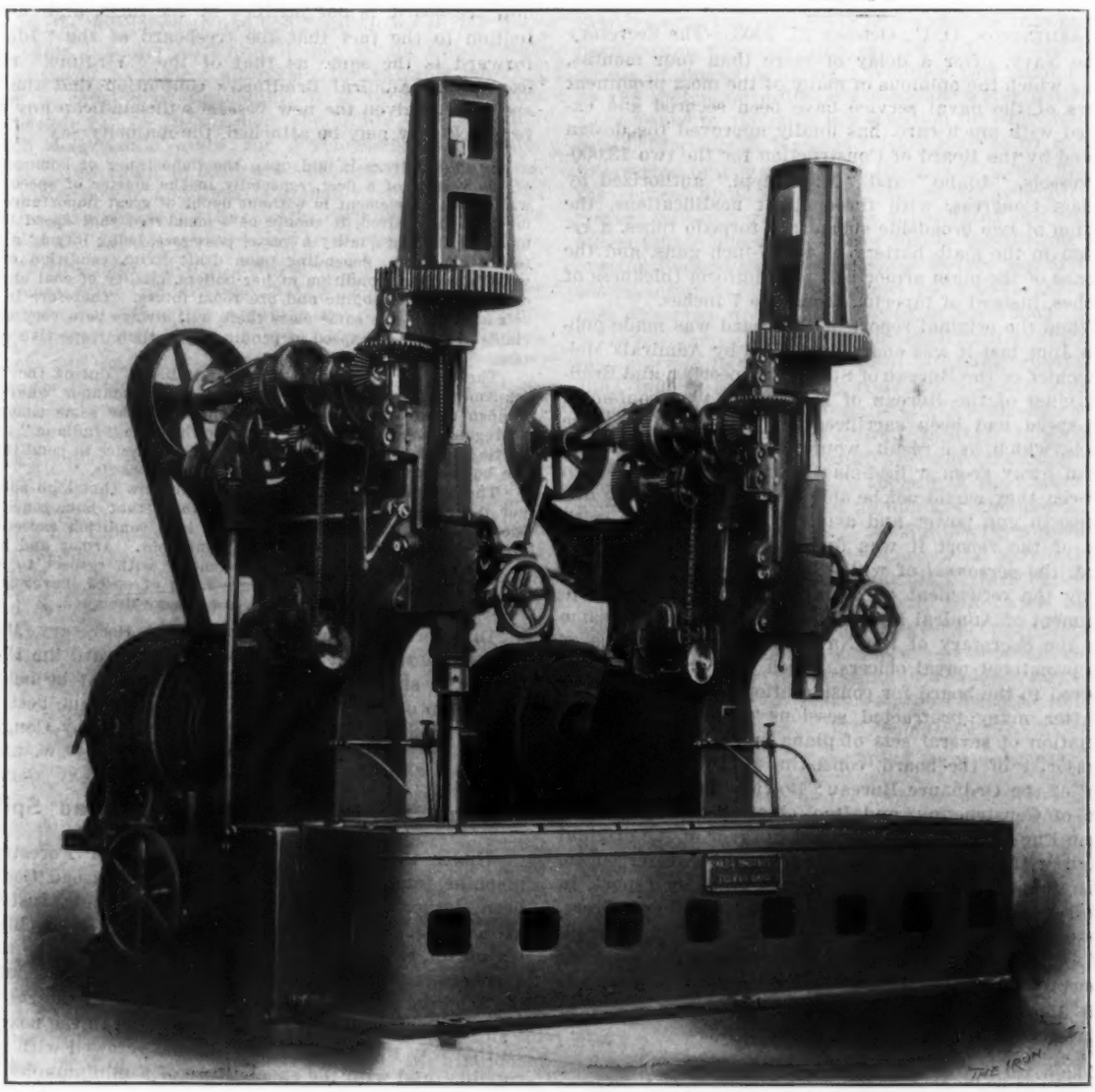


Fig. 1.—Baker Belt Driven Double Spindle Boring Machine.

In Fig. 1 is shown a machine having a spindle feed of 24 inches. Each spindle with its corresponding mechanism is entirely independent, and is driven by belt from a motor. The pulley receiving power from the motor is 20 inches in diameter and 6½-inch face. Each spindle is triple back geared, the greatest ratio of gearing being 51 to 1. In addition to the three changes provided by the back gears the motor, which is a 13 horse-power 110-220-volt Westinghouse type "S," has a speed variation of 4 to 1. The controllers, not shown in this illustration, are placed at the ends of the long table in the manner shown in Fig. 2. These controllers provide 15 steps for the forward speed and six steps for the reverse motion, making with the back gears 45 speed changes forward and 18 in reverse, giving a speed variation from 3 to 90 revolutions per minute at the spindle.

The machine shown in Fig. 2 has a spindle travel of 14 inches. Each spindle is driven from a 10 horse-power 220-volt General Electric motor, the connection being by Renold silent chain. The ratio of gearing from motor armature to spindle is 175 to 1. This machine is also triple back geared, but in addition these gears are again compounded, giving six changes of speed for each motor speed. Intermediate speeds are obtained by means of field control of the motor speed. The spindle speeds on this machine vary from 3½ to 43 revolutions per minute. Each spindle is provided with 12 rates of feed, varying from 0.1 to 0.005 inch, changes of feed being very quickly made. Both frames are adjustable along the base for variation of center to center spacing of the spindles, the left hand frame being adjustable by power. The construction is such as to admit of easy and secure fastening of the frames to the base, affording such rigidity that springing is said to be reduced to an inappreciable amount. Spindles are 3½ inches in diameter inside of the quills; the quills are 5¼ inches in diameter; the distance from center line of spindle to the frame is 18 inches; the hight of the top of the table above the floor is 28 inches.

The spindles of these machines are driven by cross arms secured to their tops and free to slide vertically between guides at opposite sides of the housings carried by the main spindle gears and turning with them. This construction obviates the difficulties commonly experi-

enced with the sleeve gear and feather, while decreasing the frictional pressure opposing the action of the feed mechanism.

These machines have been designed, and are constructed by Baker Brothers, Toledo, Ohio.

Pacific Coast News.

SAN FRANCISCO, Cal., October 19, 1903.—During the past year sales were not as large in the farm implement line as they would have been were the crops larger, and they have not been as large this fall as they would have been if we had had more rain up to the present; but they have been fairly good, nevertheless, and what has been lost up to date will be made up during the rest of the year. The good prices for wheat and barley—particularly the former—have made the farmers feel better. Of course a falling off in crops makes a difference with general merchandise dealers and manufacturers in other lines, and ultimately gets back at the hardware business, but it is too soon yet to borrow trouble from these sources.

The sale of builders' hardware, structural steel, &c., gave indications some time since of falling off, but it has not as yet, and there are doubts whether it will do so. There has been a movement among the redwood manufacturers to cut down the production of their mills by stopping night work, but after a meeting or two the matter has been laid over and it is doubtful after all whether anything will be done. This arose from the fact that there were large quantities of Oregon pine or fir thrown on the market, and prices of that article and of the poorer descriptions of redwood had to be cut down, but the prices of clear redwood have been advanced for this market and it does not look as if excessive production was troubling them much. The heavy imports of merchantable Oregon pine and the lowering of prices a couple of dollars a thousand feet will encourage those who hesitated to build, and will have a good instead of a bad effect on the building and hardware trades. During the past three weeks or so there have been a good many contracts let for the building of six to eight story steel structures, and this shows that there is a reaction in progress. I do not anticipate that it will altogether offset the movement the other way. Much will depend on prices, however, and if structural steel and other articles in the building trades should get to the point that builders think reasonable more may be induced to enter the field. There is no question that San Francisco has entered on a new era of progress and prosperity, and it will take a good deal to put a stop to it. There are two big factors in the building trade—the price of labor and that of material, and if both can be kept down to reasonable limits there will be a great demand for everything in the line of builders' hardware and structural steel. J. O. L.

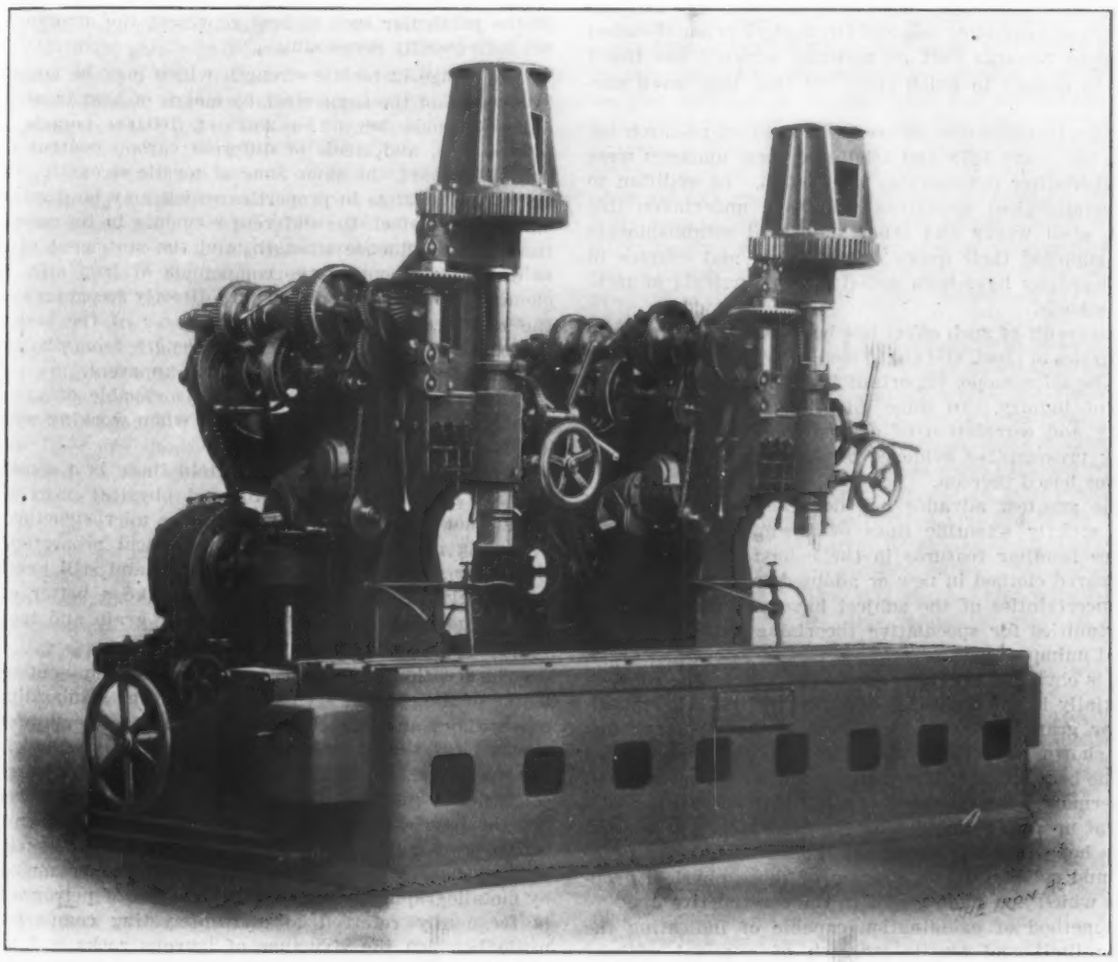


Fig. 2.—Baker Chain Driven Double Spindle Boring Machine

Sligo Iron & Steel Company.—The new mills of Sligo Iron & Steel Company at Connellsville, Pa., are now in operation and turning out soft steel and puddled iron sheets and plates, and also their well-known brands of Sligo, Crown and Tyrone bar iron. The city office and warehouse of this company are located on the South Side, Pittsburgh, where it has been for 80 years and in which they carry a complete stock for city trade. The Sligo Iron & Steel Company are successors to Phillips, Nimick & Co., which concern were one of the oldest in Pittsburgh engaged in the manufacture of bar iron and plates, the firm having been established in that city in 1825.

A. P. Witteman & Co., Philadelphia, Pa., selling agents for Cyclops Steel Works, makers of Burgess high speed self hardening steel, have established a Boston office at 70 Kilby street, in charge of H. W. Foster, who is well known to the New England trade.

Notes on the Microstructure of Steel.

BY JAMES E. HOWARD, WATERTOWN, MASS.

Historically it is known that the microscope was used in the examination of iron at a comparatively early period. The late Sir W. Roberts-Austen mentioned the microscopic examination of a chilled casting by Réaumur in 1722, and later François, in 1853, described ordinary iron as a metallic network, seen under the microscope with a magnification of 300 to 400 diameters, and who said, "these are the grains of steel which can be made to disappear by heating." At a more recent period, in 1864, we come to the work of Dr. Sorby, who, it appears, discovered and qualitatively described those micro-constituents of steel which at the present time are regarded as the most important ones; and one who has had the pleasure of examining some of Dr. Sorby's original etched specimens remarks that no material advance has taken place in respect to finish since the time they were executed.

Many investigators entered this field of research between the years 1878 and 1890, and their numbers were soon thereafter considerably augmented. In addition to the metallurgical specialists who have undertaken this study, steel works and other industrial establishments have supplied their quota of observers, and courses in metallography have been added to the curricula of technical schools.

The result of such effort has been a signal advance in the physics of steel, and the immediate work accomplished with the microscope, important in itself, has aided other lines of inquiry. In some directions the seeming continuity and correlation of observed phenomena furnish strong presumptive evidence of the correctness of conclusions based thereon.

The greatest advance has doubtless been along the more strictly scientific lines of inquiry. In some instances familiar features in the behavior of steel have reappeared clothed in new or adapted terminology, while the uncertainties of the subject have afforded abundant opportunities for speculative theorizing which have not passed unimproved.

It is obvious that the work of the microscope consists essentially in the definition of structural shapes, crystalline or granular forms. Since the microstructure has been shown to depend upon the chemical composition and the heat and mechanical treatment of the metal, and, furthermore, the physical properties also being dependent upon and modified by the same means, it has led to the hope that the microscope might be found a practical and reliable aid in judging of those physical properties which are made use of in the constructive arts.

A method of examination capable of indicating the elastic limit and tensile strength of a metal without actually destroying it would certainly be of inestimable value. Such a method in its complete state of development should be independent of those aids which in themselves indicate the probable physical properties, since steel makers are already in possession of sufficient working data concerning the influence of chemical composition and treatment to enable them to meet very exacting specifications for strength.

The microstructure in itself carries with its appearance no suggestion of the tensile properties nor the limit of endurance to repeated stresses which accompany a given piece of steel. It is through comparisons of structure with the results of the testing machine that knowledge of the forms seen acquires value. That is to say, the microscope is an indirect agent in judging of the physical properties of a metal and its position in the test, and the acceptance of material for engineering purposes must be established by a series of concurrent observations with a direct method.

If it is essential in the use of steel that certain physical properties be present, those which are called for by the specifications governing strength, then it follows in the application of metallography as a method of test that a microstructure which can be identified beyond a peradventure must accompany and be peculiar to each combination of properties which are demanded by those specifications.

To accomplish this a large number of distinct structural shapes should present themselves in order to meet the requirements of practical cases if a fair degree of accuracy is attained. Furthermore, it will necessitate the display of rare discrimination on the part of the observer who thus undertakes to interpret the structural indications, excepting it be done in a general manner.

In judging of the structure of a steel, it is more satisfactory to make an examination in the presence of the material at the microscope than through the medium of photography. Some structures are easily reproduced and photographs satisfactorily represent this material, while in other cases photographic methods are distinctly disappointing in their results. Only a small part of the surface of the material can be exhibited, and the selection of the particular spot to best represent the structure is not infrequently perplexing.

The range in tensile strength which may be acquired by samples of the same steel, by means of heat treatment alone, extends beyond a zone of 100,000 pounds per square inch, and steels of different carbon content may occupy, in part, the same zone of tensile strength. Considering the range in properties which may be displayed by the same steel, the different elements in its composition which influence strength, and the statement of Arnold, that "excepting the compounds of iron only two elements, carbon and sulphur, are directly recognizable by the microscope," the complex character of the task involved in specifically predicting strength from the indications of structure will be further apparent.

Mechanical treatment likewise is capable of greatly modifying tensile strength, at least when working within a certain range of temperature.

By one writer we have been told there is a constant relation between size of grain and physical properties, while another says that with the same microstructure in a casting as in a forging the mechanical properties of the latter will be enormously superior, and still another deploringly says "to be unable to make a better comparison between the appearance of the grain and tensile strength is exceedingly discouraging."

The position of the microscope in the prominent steel works of the country seems generally to be a subordinate one without an advancing tendency; in fact some of the works have nearly or quite suspended active participation in its use. In the inspection of material for current constructive purposes there are no specifications governing the physical properties which, so far as known, describe or demand a given microstructure for the steel, and no clause of this kind appears to be recommended by metallographic specialists. The subject of petrography is frequently referred to and interesting comparisons made between the structure of igneous rocks and metals. In the selection of building stones, however, no attention is given petrographic data in connection with questions of strength and stability of masonry.

In respect to the detection of an enfeebled state in steel by means of the microscope, Arnold says: "Both engineers and metallurgists have now to face the uncomfortable fact that steel may stand a satisfactory tensile test, then nevertheless such steel may suddenly rupture without elongation under a stress far below its elastic limit," and he adds: "The explanation of the foregoing facts is that mechanical tests cannot determine whether or no the structural constituents of a steel will cleave under long continued and severe vibratory stresses. It is to the microscope that engineers must look for this information." On the other hand, Ewing and Rosenhain say, "Within the limit of elasticity no effects of strain are detected."

The writer's observations on the ultimate effects of repeated stresses are simply these: All grades of steel, without regard to their primitive tensile properties, whether tough boiler plate, having a capacity to elongate, say, 20 per cent., or a brittle tool steel, may be ruptured by means of repeated alternate stresses with the slightest display of elongation, an elongation hardly perceptible by the aid of a micrometer. Such has been found

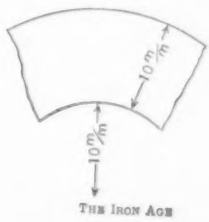
the case with several hundred test shafts, and no doubt this end may be attained with any steel. If engineers will take the trouble to ascertain the actual stresses which are received by the most strained parts of their structures, compare the intensity of these stresses with the original properties of the metal, and also compare the number of repetitions with the results of the experiments of Woehler and others down to the present time, the mysterious characteristics of certain ruptures will largely disappear. If it is possible for the microscope to show the traits which contribute to this end in one steel the detection of their presence may confidently be expected in all.

Steels which have been subjected to repeated alternate stresses of 40,000 pounds per square inch, and eventually ruptured after 150,000,000 repetitions have been microscopically examined and no characteristic difference discovered between the metal thus strained and the same steel taken near the neutral axis of the shaft, where practically no stress had been received. The aggregate distance which 1 inch in length of this shaft extended—*i. e.*, the product of the elastic extension by the number of loadings—was 3 1-3 miles, and the same distance was also traveled in the compressive direction.

Concerning internal strains, which may be introduced into steels by sudden quenching from a temperature of, say, 900 degrees F., it appears that the microscope is inadequate to indicate the presence or the absence of such internal forces. Internal strains may reach a value coincident with the elastic limit of the metal, they may be so disposed as to act in harmony with or in opposition to applied forces from without, and there are reasons for entertaining the belief that a state of intense internal strain is a precursor of the usual fractures of steels under repeated loads which are so often styled mysterious, since they are unaccompanied by the usual distortion witnessed in the testing machine where rupture is effected in another manner.

The path of rupture through a piece of steel might reasonably be expected to follow the proverbial line of least resistance, and the examination of a fracture therefore reveal the weaker micro-constituent. Bearing upon this question, three types of rupture were inspected, in each of which a well defined granular or cellular network was present. The first case, a 1.10 per cent. carbon steel, had a number of thermal cracks, caused by repeated exposure to the combustion of gunpowder. Some of the cracks took a sinuous course and followed the network, bifurcating in front of a grain, and passing along on either side. Other cracks passed directly through the grains and bifurcated within the borders of one of them. The larger number of cracks took a seemingly indifferent course through the steel in disregard to its cellular structure. Another case of thermal cracks was in a 0.60 per cent. carbon steel gun tube, in which the metal also had been exposed to powder gases, and at the same time to a high tensile stress. In this tube none of the cracks inspected followed the microscopic network. The third case was the journal of a puddled iron car axle. A crack had developed in service at the inner end of the journal, and had penetrated to a depth of 0.03 to 0.05 inch when the axle was removed from its truck. The course of the crack was through the metal in apparent disregard to the microstructure. The boundaries of the grains were met at very acute angles without an appreciable change in the direction of the crack. So far as could be judged from these examples, in which cracks were formed by high temperature conditions, unaccompanied and accompanied by tensile stresses, and those caused by stresses at ordinary temperatures, the metal ruptured along lines in which the influence of the microstructure, if any, was not detected.

Heyn calls attention to "how extraordinarily sensitive are metallographic methods relating to the discovery of permanent deformations," and furnishes the example here sketched. The microscope showed the expected difference in shape of the grain taken on opposite sides of the neutral axis. The meritorious feature probably consisted in demonstrating that the metal had been bent and not machined into its present shape, since it is sufficiently obvious to the eye that the piece is not straight. Howe styles it the development of schistosity in referring to the appearance of the grain after cold distortion. At ar earlier period Kirkaldy and Rosset illustrated the surface changes in their test pieces by describing a series of geometrical figures on them before testing and noting the modified shapes thereafter.



THE IRON AGE

Houghton, before the Institute of Marine Engineers, April, 1902, said: "With respect to the evil effects of cold hammering it does not require any special knowledge to see that the crystals are so crushed and bruised that very little adhesion can be left." On this point the late Dr. Siemens, before the Institute of Naval Architects, April, 1881, said of a high-class metal: "It will simply flow when put to a great local strain, and the ultimate strength will increase," and added, "that of good mild steel it might be said what the old proverb attributes to a wife and a mulberry tree, 'the more you beat it the better it be.'" The results of tests appear to sustain the position of Dr. Siemens.

Slip bands, so-called, microscopically observed on the surface of overstrained metal might be classed with the commonly developed paths along which the removal of scale occurs, the effect of stress beyond the elastic limit. These paths take a shearing direction—that is, oblique to the direction of the applied stress—and intersect without interference. The same lines appear on steel punched or sheared at ordinary temperatures and are taken to signify the relief of overstress by the local yielding of the metal along these well defined paths. At higher temperatures there is a dispersive effect. This behavior may be seen on any piece of steel having the scale on it, and sometimes on finished metal.

Ductility in rail steel seems to be regarded as of prime importance by metallographists and a microstructure preferred which is said to indicate its presence. It should not be overlooked that ductility itself is not the property which is generally developed in the endurance of steel to long continued or oft repeated stresses. It is a property the display of which engineers are generally desirous of avoiding in permanent structures.

The tests of two grades of steel will be given to illustrate the relative endurance of a mild and a hard steel under repeated stresses.

Tensile tests were as follows:

	Elastic limit. Pounds per square inch.	Tensile strength. Pounds per square inch.	Elongation in 6 inches. Per cent.	Cont. of area. Per c't.
0.17 carbon bar	48,000	71,360	24.2	49.7
1.09 carbon bar	70,000	132,320	9.7	15.0

As commonly understood, the 0.17 C. bar certainly displayed the greater ductility of the two.

A shaft from each grade was tested by repeated alternate stresses, under a maximum fiber stress of 40,000 pounds per square inch. The 0.17 C. shaft ruptured at 366,500 repetitions, while the 1.09 C. shaft endured 130,000,000 repetitions without rupture, and was subsequently fractured under a higher fiber stress.

The mechanical work of the most strained fibers per cubic inch of each test was as follows:

	Mechanical work.	
	Tensile test. Foot-pounds.	Endurance test. Foot-pounds.
0.17 C. steel	1,023	814,000
1.09 C. steel	945	288,000,000

In the tensile tests about the same amount of work was necessary to rupture each steel, while under repeated stresses the 1.09 C. shaft displayed an endurance over 350 times that of the softer metal. The comparatively small amount of work done in either of the tensile tests will be noticed. If the endurance test be accepted as an

index of the probable behavior of the metal in a rail, it follows that high strength rather than ductility contributes chiefly toward long service in the track.

As to durability and tendency to rupture, the Great Eastern Railway (English) reports: "Soft rails wear down under heavy traffic very rapidly, and do not appear to be more exempt from breaking than fairly hard ones."

Durability, however, does not appear conditional upon the presence of a fine grain, as a rail of unusual abrasive resistance, outwearing a number of ordinary rails, has come to the writer's attention, in which the structure of the metal is so coarse as to be visible without the aid of the microscope.

In conclusion, it is not thought that the subject of metallography is in that state in which the microscope may be implicitly used for the accurate determination or recognition of those physical properties in iron and steel which give strength and safety to engineering structures.

Notes from Mexico.

Increase in Production of Copper and Lead.

DURANGO, October 20, 1903.—The fourth sub-committee of the Monetary Commission, which has been sitting in the capital for some months, in a report recently made, demonstrate by a series of tables the great impetus which the rise in foreign exchange has given to the production of gold, copper and other nonsilver ores. The domestic output of ingot copper is shown to have advanced from 5,364,871 kg. in 1890 to 33,606,095 in 1901-2, while lead advanced from 8,138,194 kg. in 1890-1 to 98,254,033 in 1901-2.

Export of Ore.

The important part which the railways of the republic have played in the development of its most prominent industries is shown by the steady expansion of those interests with which they come closest into contact. For example, the shipments of ore abroad since the construction of the principal systems, the Central, National and International, have greatly increased in the last 18 years. In 1884-5 the value of such exports was $1,447,342, and in 1900-1 it had arisen to $15,057,482, but in 1901-2 there was a decline to $6,981,565.

Silver's Depreciation and the Import Trade.

The effect of silver's depreciation upon the prices locally charged for merchandise brought into the country is a subject to which the commissioners give careful attention. In the face of the sudden and extreme advances of the rate of exchange, which the importers have had to meet from time to time, their position has been one of singular difficulty. While the instinct of self preservation has, of course, compelled them to advance their prices in order to prevent the balance being upon the wrong side of the ledger, the quick action of the exchange market has not infrequently made an equitable adjustment of figures a problem which would tax the proverbial acumen of a "Philadelphia lawyer.' Under these conditions only one course was safe, and of this the importers naturally availed themselves. To quote from the interesting report before referred to:

> Merchants engaged in the import trade were certainly unable to foresee the extreme depths which the depreciation of silver has reached in recent times. The depreciation of the white metal, after the great collapse of the year 1893, was progressive, but not gradual, and although it permitted commercial interests to enjoy for given periods of time a certain degree of stability, it obliged them from time to time to face new ond more accentuated declines. The merchants, who kept putting up their prices to the highest point which they deemed necessary to protect themselves against the possibility of a still heavier depreciation of silver, before long found all their calculations upset by reason of still higher flights of exchange. The successive lessons which the merchants thus received finally decided them to raise their prices out of all proportion to the depreciation of silver in order to place themselves once for all beyond the reach of new surprises which the future might have in store for them.

Notwithstanding this increase of prices, people who consume imported luxuries, as well as those who are compelled to pay higher prices for imported necessaries, do not seem to have seriously felt the burden, for the imports have steadily increased. Although there has been no absolute need for the action, merchants dealing in purely domestic goods have in many instances turned this rise in the value of foreign merchandise to account by a sympathetic movement in the marking up of their prices for home products.

Industrial Notes.

In July of the current year the total value of the imports was $6,774,931.92, gold; in July of last year the aggregate was $6,224,678.53. Of the total for July of this year North America was the principal source of supply, merchandise to the value of $3,695,565.98 being credited to it, against $2,983,140.95 to Europe. Among the imports were: Machinery and apparatus, $759,936.77; vehicles, $187,695.92; arms and explosives, $141,584.85. In the same month the exports aggregated $22,062,045.86, silver; in July, 1902, the total was $12,743,534.30. The exports for July last included: Copper, $1,268,554.40; lead, $565,106, and manufactured products, $937,995.65.

Rolling stock ordered some time ago for the Vera Cruz & Pacific Railway is being received. The order includes five locomotives from the Baldwins, and nearly 200 modern equipped box cars from the St. Louis Car & Foundry Company of St. Charles, Mo.

The death is announced of William C. Dingey of the firm of Dingey, Graham & Co. of the City of Mexico, manufacturers' agents for mining machinery and supplies.

The important project of draining by a system of deep tunnels a number of flooded mines in Guanajuato seems to be well under way. It is now reported that the mine owners of the district will contribute $20,000 to the funds of the company formed to carry out the undertaking, named La Luz Drainage & Transportation Company.

Richard Honey, one of the pioneers in establishing the iron manufacturing industry in Mexico, and the owner of a plant in the State of Hidalgo, has been appointed interim manager of the International & Mortgage Bank, of which institution he is a large stockholder.

The continued increase in the exports of copper is shown by the figures giving the total value of copper and copper ore exported in the first ten months of the fiscal year 1902-03, compared with the aggregate for the same period in the preceding fiscal year, as follows:

	Tons.	Value.
Ten months of 1902-03.....	49,581	$16,142,084.36
Ten months of 1901-02.....	33,920	10,462,591.60
Increase	15,661	$5,679,492.76

Mariano Meana has been appointed customs agent at Vera Cruz for the Mexican and Interoceanic railways in the place of Antonio de Asco.

It is reported that the firm of McKenzie & Kennedy of New York have obtained the contract covering the construction of a reduction plant which is to be built for J. B. Haggin, near Chihuahua, at a cost of $3,000,000.

The report is confirmed that a large order for heavy steel rails has been placed by the Central Railway Company with the Monterey Iron & Steel Company.

A concession has been granted by the Government to the National Railway of Mexico, covering the construction of a line from Salamanca to San Juan de la Vega. Salamanca is a station on the Central Railway at kilometer 333, and San Juan de la Vega is upon the main line of the National from Mexico City, at kilometer 367. The road is to be broad guage, "but the concessionaire is granted the right to lay a third rail so as to make a 3-foot gauge for the transportaion of narrow gauge material." Fifteen kilometers must be finished within 18 months, and at least the same distance each following year until the line is completed.

With the reorganization of the Xico & San Rafael Railway, which runs from the City of Mexico to Apizaco under the name of the Mexican & Great Eastern, comes the report that this road will soon become an important factor in the railway situation in the extreme south if the plans of the New York people, who are said to have taken the bonds, are carried out. These plans are stated by a leading daily of the capital to include the immediate letting of contracts and the employment of forces of workmen "to extend the road south, with the object of reaching the Isthmus of Tehuantepec, and there connecting not only with the Tehuantepec National but with the Pan-American, giving that road a direct outlet, not

only to this city, but to the States." Further commenting upon this important project, the same journal says: "By the completion of the extension of this road to the Isthmus it will mean a saving of several hundred kilometers to the Pan-American when it has finished connecting its road. It is reported that the Xico & San Rafael is in the market for about 2000 freight cars, and also a number of engines, for next year's delivery."

A concession has been granted to Cristobal Pizana to utilize for irrigation purposes 312 liters of water per second from the Guayalejo River, in the district of Villa de Llera, State of Tamaulipas. Piping will be required for this enterprise.

John Bohl, for many years manager of the hardware house of Sommer, Herrmann & Co., of the City of Mexico, died in that city last week. Mr. Bohl was a native of Germany and long a resident in the republic.

The activity in the line of establishing irrigation systems and drainage works is manifested by the large quantity of piping now coming into the country. In September about 250 tons were imported.

The Pan-American Railway Company are in the market for rolling stock, and will soon place orders for box and stock cars, and probably for locomotives also. An engine built in England has lately been received by the company.

Merchandise shipped in Mexico is at present subject to some delay at the border on account of the quarantine regulations, which require the thorough disinfection of all goods passing through Laredo. J. J. D.

In the issue of *The Iron Age* for October 15 we published a brief reference to an acetylene blow pipe, which is reported to have been used for five or six years with great success in France, but so far as we have been able to ascertain, it has not been introduced in this country. The statements made were taken from an article in *Le Genie Civil*, by A. Janet, but we are unable to supply the name of the makers of the apparatus.

A New Geared Speed Changing Device.

For the purpose of producing a device for increasing and diminishing the speed of machines quickly which is compact and can be placed in universal use without the necessity of employing a special countershaft where a machine is so driven, and one that can be coupled direct to a motor in the case of an electrical drive, the National Machine Tool Company of Cincinnati, Ohio, have just designed an apparatus which they have named their improved speed changer.

The principal object in bringing out this design of speed changer has been to make it adaptable to the many varied conditions of driving and to also produce a design which can be manufactured as an article of stock and sold in standard sizes suitable to meet the requirements of the trade. With a view to ascertaining the needs of machinery builders and users W. L. Schellenbach, president of the National Company, recently made a tour of several hundred works throughout the country. The operating mechanism, in the main, employs the Schellenbach method of raising the gears by the sliding cone and fixing them to the clutches.

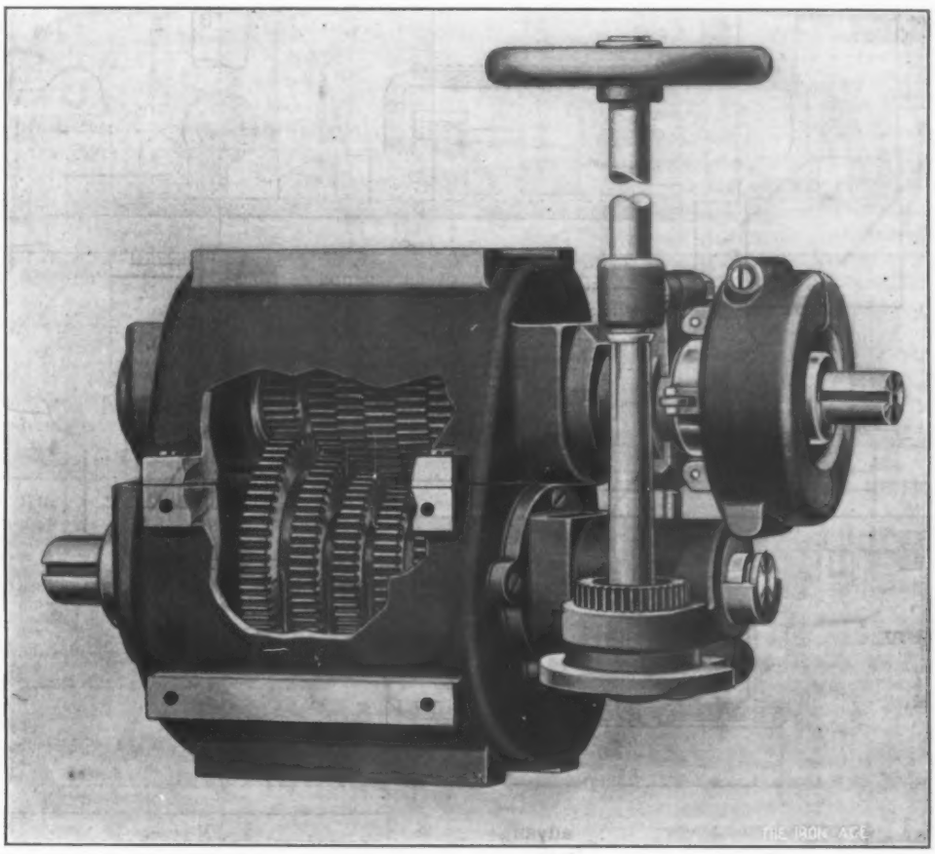


Fig. 1.—Perspective View, with Casing Broken to Show Gearing.

A NEW GEARED SPEED CHANGING DEVICE.

The outward form and adaptation of the apparatus is entirely new. As will be noted from the perspective view, Fig. 1, the gearing is contained in a casing or main frame which is oil tight, making it possible for the gears to run in a bath of oil. Ring oil bearings of genuine babbitt are provided. The gear casing is designed to be separated directly between the two shafts, the upper and lower halves being doweled and held together by screws. The gear casing, it will be observed from Fig. 1, contains planing pads running its entire length on four sides and on its top and bottom. These pads are drilled and tapped and are arranged to receive a form of hanger which can be attached to the top for bolting it to the ceiling, to the sides for bolting it to the wall and to the bottom when mounting it directly upon the floor.

In using it as a regular countershaft, it is only necessary to have the gear casing and necessary hanger for at-

taching it. The usual cone pulley countershaft may be cut off at the cone and attached to shaft A A, Fig. 2, of the speed changer by a coupling, thus avoiding the extra expense of these pulleys, which is usually incurred in adopting a drive of this character.

The device may be connected directly to an electric motor, giving a mechanical speed change having a ratio of from 8 to 1 to 2 to 1 arranged in geometrical progression. By means of the planing pads the apparatus may also be bolted direct to the side or any part of a machine

to receive it either above or below the casing, as showing by the dotted lines in the sectional views, Fig. 2. Lever B B is also used for operating the friction clutch shown on shaft A A. The upper cone of gears, excepting the small pinion, which is turned to shaft A A, is controlled by the friction. The largest gear of the lower cone is always in mesh with this pinion and transmits the slowest speed to the lower shaft by a ratchet device, the pawls of which are carried by it. The ratchet, which is really a part of the lower shaft, will always revolve

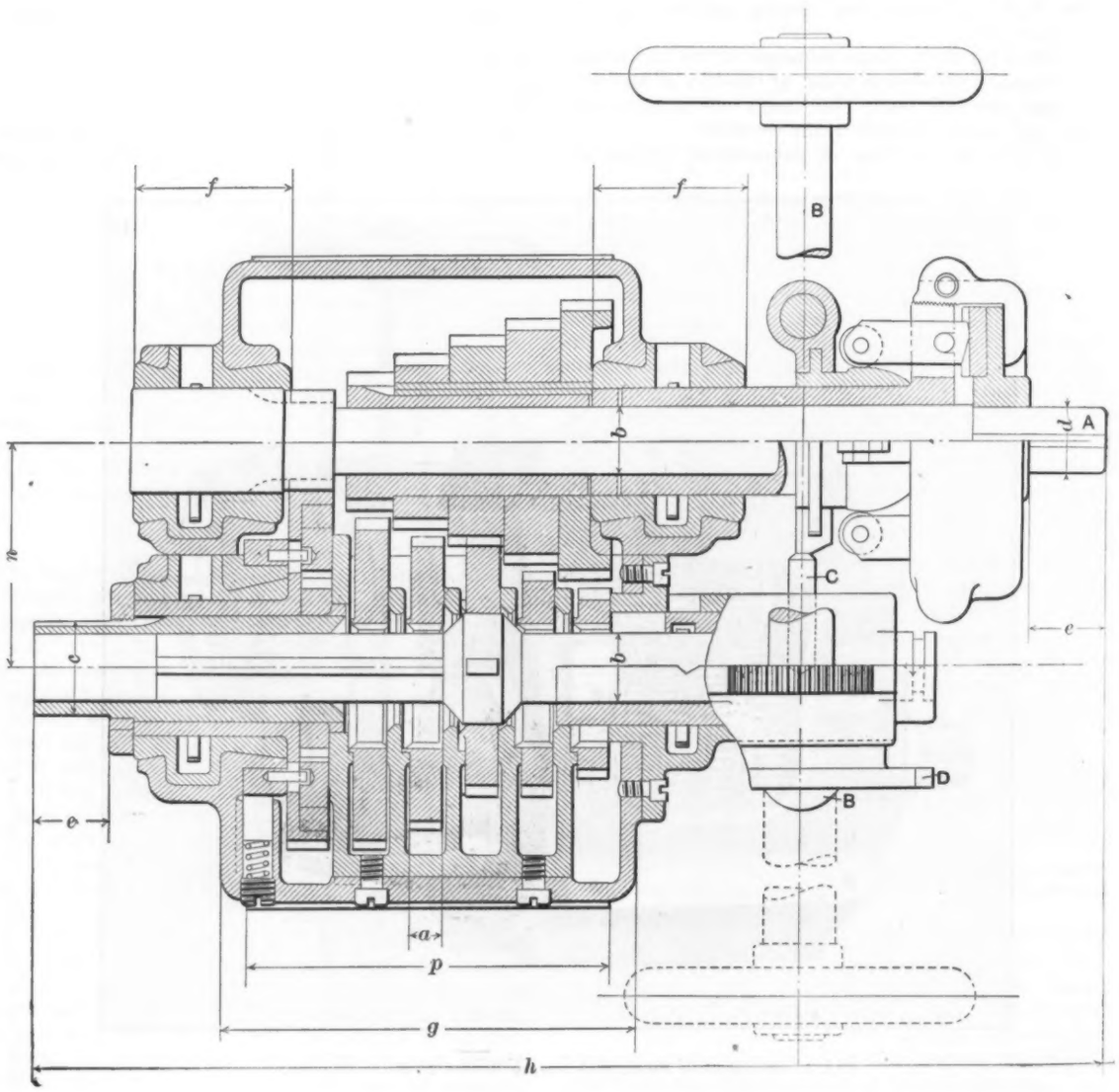


Fig. 2.—Longitudinal Section.

tool. The drive is so arranged that while a change of speed is being made the slowest speed of the series is always in action. That is, if it were necessary to change from the highest speed to any other of the series, the friction shown on the upper shaft would be released and the speed diminish until reaching the slowest stage, continuing at that speed until the desired speed was selected, which speed would become operative the instant the friction was engaged.

The changing is performed as follows: The lower shaft is made of tool steel turned down, leaving an enlargement at about the center, which is beveled at both edges and is provided with tool steel spring kys to clutch into the seats cut into the bores of the gears. The lateral motion of the enlargement of the lower shaft imparts vertical motion to the gears, meshing and unmeshing them from their mates above as it passes through their bores.

The lateral motion of the lower shaft is imparted by a rack sleeve and a gear meshing therewith which receives the ball seated lever B B.

This lever carries a hand wheel and can be arranged

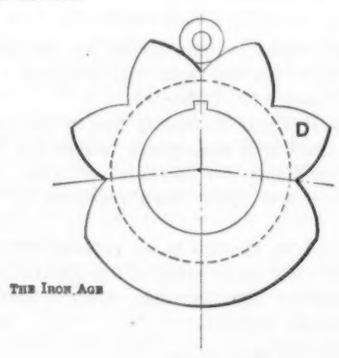


Fig. 5.—Plan of Cam.

A NEW GEARED SPEED CHANGING DEVICE.

faster than the pawls when any speed other than the slowest is used and will then be running idly, but the moment the friction is released the lower shaft will slow down until it reaches a speed equal to that of the

pawls. The pawls are automatically reversible, so that they will be effective when running in either direction. When the friction is engaged the lower portion of the yoke which operates its cone rests directly on the top of plug C C, the lower end of which is beveled to fit into the notches of the sliding rack sleeve which operates the lateral movement of the lower shaft. This makes an effective locking device which compels the releasing of the friction, thus taking all load from the gears while a change of speed is being made, and also prevents the locking of the friction if the change is only partially completed.

A spring seated plug carrying a roller which engages cam D D secured to rack gear determines the proper lateral adjustment of the lower shaft. The ratios and numbers of speeds may be made to suit almost any condition and the hand wheel indexed to correspond to the speeds.

A feature of particular advantage is the compactness of the entire apparatus. As will be noted from the table of sizes, Fig. 6, the width over all on a changer of ½ horse-power is but 12 inches, while on the largest size made, 10 horse-power, the width is but 35 inches. All gears used are made of mild steel forgings.

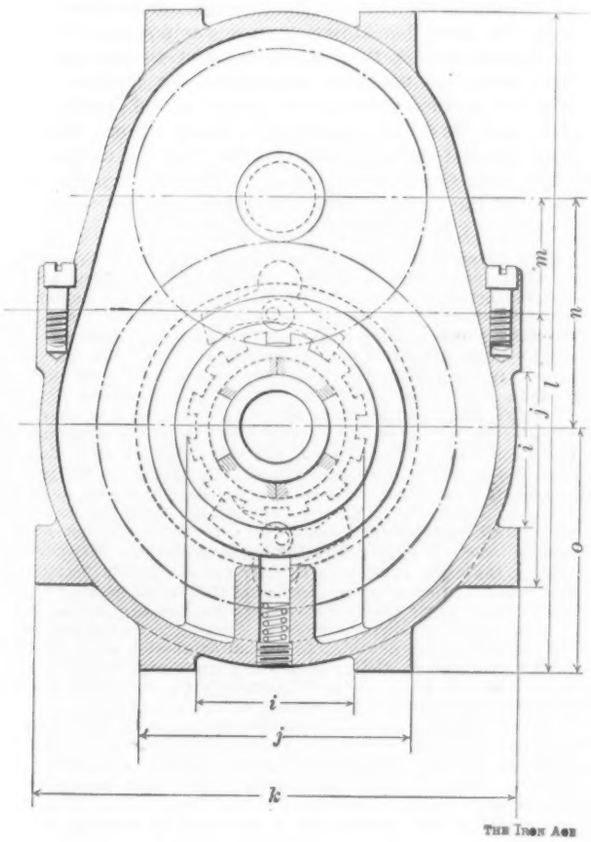


Fig. 3.—Cross Section.

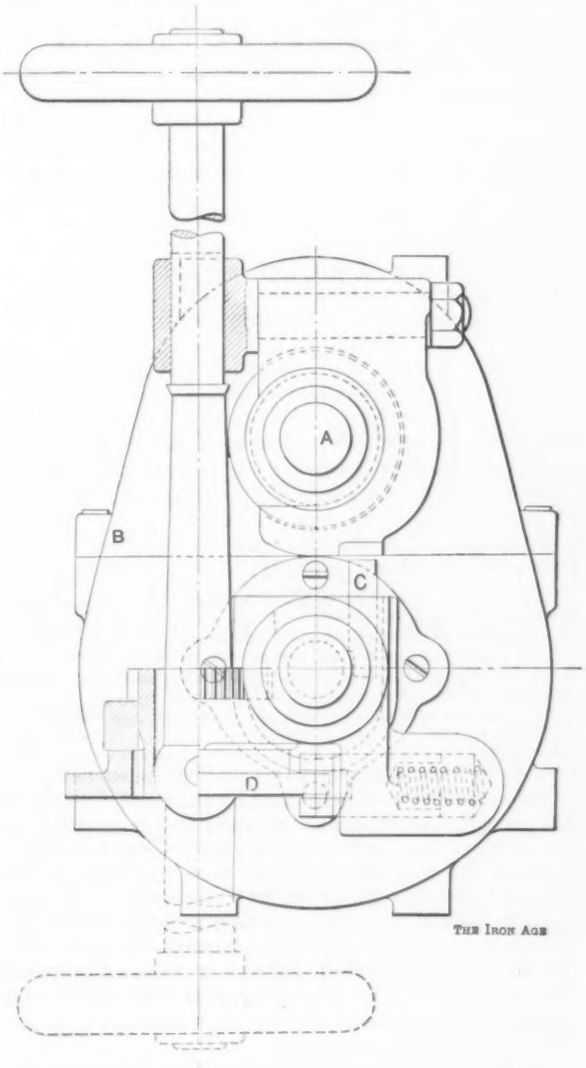


Fig. 4.—End Elevation.

Horse-power, 375 R.P.M.	Pitch gears.	Dimensions. Corresponding to Indicators in Fig. 2. a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k	l.	m.	n.	o.	p.
½	14	⅜	13/16	1 1/16	11/16	⅞	1¾	4 11/16	12	1¾	3	5⅜	7¼	1¼	2½	2 11/16	4 1/16
1	12	9/16	1	1 7/16	15/16	1	2⅝	6¾	16	2	3½	6⅞	8½	1 11/24	2 11/12	3 5/16	5
2	10	¾	1 3/16	1 11/16	1⅛	1¼	3	8½	21⅞	2¼	4	8	10½	1¾	3½	4	7½
4	7	⅞	1 7/16	2 1/16	1⅜	1½	3⅝	10¼	25⅜	2½	4½	11	14¾	2½	5	5½	9½
7	6	1	1 11/16	2½	1⅝	1¾	4¼	12	29½	2¾	5	13½	17½	2 11/12	5 5/6	6¾	11
10	5	1⅛	1 15/16	2¾	1 13/16	2	5	13¾	35	2½	5½	16	21	3½	7	8	12¼

Fig. 6.—Dimensions of the Various Sizes of Changers.

A NEW GEARED SPEED CHANGING DEVICE.

A Pioneer Pumping Engine.—The first triple expansion direct acting pumping engine installed in this country was put in by the city of Concord, N. H., 11 years ago. This engine, which was manufactured by the Worthington Company of New York, was designed to supply 2,000,000 gallons of water per day, which was ample for the needs of the city at that time. The population of Concord has now increased, however, to 20,000 inhabitants, and it is found desirable to enlarge the pumping equipment to maintain reserve capacity. To this end a duplicate engine has been ordered from the Worthington Company of the same size and type, but embodying the many improvements which have been made in pumping machinery during the period. The steam cylinders are 9, 14 and 22 inches in diameter, and the water ends, which are of the plunger and ring pattern, are provided with 12½-inch plungers, the stroke being 18½ inches. The steam pressure is 100 pounds, and the water pressure created by the pump is the same. The pump receives its water supply by gravity from the Merrimac River at a pressure of 50 pounds, and discharges into a reservoir, from which the city receives its supply.

The Bradley Electric Smelting Patents Sustained.

NIAGARA FALLS, N. Y., October 26, 1903.—Through a decision rendered by the Federal Court of Appeals on Thursday, October 22, a new and very important turn has been given to the long litigation over the patents for the manufacture of aluminum. In this country the Pittsburgh Reduction Company of Niagara Falls have for the past 11 or 12 years controlled the process, and while doing so have materially reduced the price on the metal and have vastly increased the output through their two big plants at Niagara Falls. The court decision just rendered is in favor of the Electric Smelting & Aluminum Company and against the Pittsburgh Reduction Company, and thus sustains the validity of the famous Bradley patents. The court has ordered an accounting of the profits for the time the processes have been used, which is about 12 years. The court also issued an injunction restraining the Pittsburgh Reduction Company from the use of the process.

The suit of the Electric Smelting & Aluminum Company against the Pittsburgh Reduction Company is one wherein the latter company are sued for infringement on two patents applied for in 1883 and issued in 1892 to Charles S. Bradley, involving the process practiced at Niagara Falls in the manufacture of aluminum. The suit has been pending in the courts some years. The nature of the claims may be deduced from the following two examples taken from the patents:

The process of obtaining aluminum from its ores or compounds, consisting in passing an electric current through a forced portion of the aluminum ore or compound contained in an unfused body or heap of said ore or compound.

The continuous process of separating or dissociating aluminum from its ores or compounds, consisting in fusing and maintaining the fusion and electrolytically decomposing the ore or compound by the passage of the electric current therethrough, and charging the bath with fresh quantities of the ore or compound as the reduction proceeds, substantially as set forth.

These patents were purchased by the Cowles people in 1885. A long and expensive litigation over their title was had between the Cowles Electric Smelting & Aluminum Company and a patent lawyer in New York City by the name of Grosvenor P. Lowry, who also made a purchase of these patents from Mr. Bradley, probably under the assumption that the original assignment to the Cowles Company was not perfect. After four years of litigation this suit was won in the higher courts by the Cowles Company. The present suit was then begun against the Pittsburgh Reduction Company.

In 1891 the Cowles Company sued the Pittsburgh Reduction Company under patents covering about the same ground that were issued to the Cowles Brothers, but that suit had to be withdrawn because of these Bradley patents bearing an earlier date of application than the Cowles patents issuing from the Patent Office assigned to Lowry. Lowry was the American representative of the great aluminum company at the Falls of the Rhine, in Switzerland.

Romaine C. Cole, who was the promoter of the Pittsburgh Reduction Company in 1888, was in 1887 the business manager of the Cowles Company. Charles M. Hall, the present manager of the Niagara works of the Pittsburgh Reduction Company, a man who has done much in the field of aluminum manufacture and who is the claimed inventor of the Pittsburgh Reduction Company's process, performed his early experiments at the Cowles works in Lockport during part of the years 1887 and 1888.

In 1892 the Cowles Company were operating the process alleged to be the same as now in use at Niagara Falls in the manufacture of aluminum. It consists in fusing the materials in a large iron tank, open at the top and lined over the bottom by a heavy mass of carbon. The electricity passes into the fused material by means of a number of heavy carbon rods 3 or 4 inches in diameter, whose ends hang down into the liquid bath. The aluminum is said to be deposited much as nickel is deposited by electrolysis, and collects as a mass of molten metal below the fused bath of aluminous material. No heat is used except that evolved from the current.

In 1892 the Pittsburgh Reduction Company sued the Cowles Company under a patent that Mr. Hall had secured. The United States Court at Cincinnati, in 1895, construed the Hall patent very broadly, and enjoined the Cowles Company from continuing the manufacture of pure aluminum. Since that injunction the works at Lockport have been devoted to other purposes.

It will be seen that there have been several suits over the aluminum patents. In 1901 Judge Hazel, in Buffalo, rendered a decision in the United States District Court for the Western District of New York in a case where the Electric Smelting & Aluminum Company had begun equity proceedings against the Pittsburgh Reduction Company for alleged infringement of a patented process for cheaply separating aluminum by an electrical process. Judge Hazel held that the Pittsburgh Reduction Company did not infringe the patents of the plaintiff; that Hall's patent was not an infringement on Bradley's patents. He held that Hall's process was not an alteration of Bradley's, and that one ingredient in the chemical bath used had not been substituted for another. The case just decided developed on appeal of the Cowles Company from the decision rendered by Judge Hazel. Extracts from the last decision, which states that the controversy relates solely to the separation of aluminum from its ores, and that the investigation is therefore confined to the one metal, are given herewith:

The judge of the Circuit Court, after careful and painstaking research, reached the conclusion that Bradley had made a valuable invention, but he failed to grant relief to the complainant upon the theory that the process which the defendant uses was an entirely separate invention, neither dependent upon nor subsidiary to the invention of Bradley. In this we think there was error. Hall's achievement should be considered in the light of an improvement upon Bradley's fundamental discovery.

There can be little doubt that the defendant's process is a valuable one, and that to it is largely due the cheap aluminum of the present day. There is not the least disposition to detract from the merits of Hall or minimize his contribution to the art. Indeed, it may be conceded that, if the novel features so introduced be secured by a valid patent, he can hold the monopoly against all, Bradley included. This concession does not permit him, however, to appropriate the broad invention. He does not acquire the right to use the Bradley process simply because he has improved that process. He is entitled to enjoy what is his, but in doing so he cannot appropriate the property of another.

That differences exist cannot be denied; that they are material is strenuously denied. To use an expression more familiar to lawyers than to electricians, the complainant contends that there has been a failure to "distinguish on principle" the defendant's process from the process of the patent.

Speaking generally, it is thought that most of the points of variance relied on can be traced directly to the improvement introduced by Hall—namely, the use of cryolite as a solvent for alumina. Were it not for this change it is hardly probable that infringement would be denied. But the change of materials does not create a new process but a new way of working the old process.

The complainant's position regarding the Hall process, as used by the defendant, is sententiously stated in one of the briefs as follows:

"We contend that the process actually practiced by defendant is that of Hall *minus* the impracticable external heating feature shown by Hall, and *plus* the desirable and eminently successful internal heating feature of Bradley."

Hall starts by fusing cryolite and maintaining fusion by means of the electric current; so does Bradley; at least in the example given in the patent cryolite is the ore mentioned. If no other ore were added by Hall the processes up to this point would be identical. But Hall found that alumina, which is just as much an ore of aluminum as is cryolite, dissolves readily with cryolite as a solvent or flux, and he was thus enabled to produce a more efficient and cheaper electrolyte.

The Bradley process is not confined to cryolite or alumina; it relates to all ores or compounds of aluminum and all other refractory ores of a like type. Cryolite is mentioned as an illustration in the specification, but it might as well have mentioned alumina or any other similar ore. That there is nothing in the patent, or out of the patent, requiring the limitation of the claims to cryolite seems too plain for debate.

Various other limitations upon the claims are urged by which the defendant seeks to avoid infringement. They are of the same general nature and proceed upon the same initial fallacy—namely, that in a generic process patent every phenomenon observed during operation and every minute detail described must be read into the claims, and that the least departure from the claims as so construed avoids infringement. Neither position is tenable.

In a patent like Bradley's the claims should be as broad as the invention, and even if unnecessary and unreasonable limitations are incorporated in the claims, the court should interpret them liberally and not permit a defendant to escape who reaches the same result by analogous means, though he may employ additional elements and improve mechanical appliances.

It is asserted that the Bradley process is not operative. Having found that the defendant is using the process and it

appearing that the annual output of its works is now over 7,000,000 pounds, it seems unnecessary to enter upon an extended discussion of this proposition. There is, however, ample proof that the patented process when practiced experimentally produced aluminum, and there is also proof that practically the same process was commercially operated for short periods both in this country and in Europe.

The Pittsburgh Reduction Company can appeal to the Supreme Court of the United States on the points at issue, and it is hardly to be supposed that litigation that has been so vigorously fought by both sides will rest until the court of last resort has rendered its decision. Up to the time of this writing there had been no cessation of operations at the big plants of the Pittsburgh Reduction Company at Niagara Falls, and it is understood that they expect to continue right along.

Robert H. Thurston.

Prof. Robert H. Thurston, director of Sibley College, Cornell University, died of heart disease last Monday. It was the sixty-fourth anniversary of his birth, and to celebrate the event he had invited Dean Huffcut of the College of Law, Professor Hewett, Andrew D. White, former president of the university, and others to be his guests at dinner. He had been in apparent good health, and had just returned from a walk. He seemed to fall asleep, but when his wife tried to rouse him it was found that he was unconscious, and he died before a physician could be called.

ROBERT H. THURSTON.

Professor Thurston was born in Providence, and received his early training in the shops of his father, who was a well-known mechanical engineer. He pursued the scientific course at Brown University, from which he was graduated in 1859. After two years with his father he entered the navy as third assistant engineer. During the Civil War he served on several vessels, and was with both the North and South Atlantic Squadrons. Afterward he was appointed assistant professor of natural and experimental philosophy at the Naval Academy at Annapolis. He visited and studied the iron manufacturing establishments of England, and in 1872 resigned from the navy with the rank of first assistant engineer. One year before this he was called to the professorship of mechanical engineering at Stevens Institute. This chair he occupied until 1885, when he went to Sibley College as director and as professor of mechanical engineering.

Professor Thurston was a member of several United States commissions, among others the commission to the Vienna Exposition in 1873, where he served on the international jury and edited the "Reports of the United States Commissioners." He was also a member of the board to test metals and the board to investigate boiler explosions. He was the first president of the American Society of Mechanical Engineers and a liberal and valued contributor to its transactions. He was a frequent attendant at the meetings, the pleasure and profit of which were greatly enhanced by his pleasing address and deep and accurate knowledge. He was vice-president of the American Association for the Advancement of Science in 1877 and 1884, and also of the American Institute of Mining Engineers in 1878.

Professor Thurston occupied a prominent place as an inventor, designing a steam engine governor, a device for testing lubricants, an autographic testing machine and many other appliances. He was a liberal contributor to the scientific press, and an always welcome speaker before scientific and other societies. Among his published works are the following:

"A Manual of Steam Boilers—Their Designs, Construction and Operation;" "Friction and Lost Work in Machinery and Mill Work;" "Animal as a Machine and Prime Motor and the Laws of Energetics;" "Handbook of Engine and Boiler Trials and the Use of the Indicator and the Pony Brake;" "Handy Tables for Laboratory Computations;" "Manual of the Steam Engine—Part I, History, Structure and Theory; Part II, Design, Construction and Operation;" "Materials of Engineering—Part I, Nonmetallic;" "Materials of Engineering—Part II, Iron and Steel;" "Materials of Engineering—Part III, Brasses, Bronzes and Other Alloys;" "Reflections on the Motive Power of Heat (Carnot);" "Stationary Steam Engines;" "Steam Boiler Explosions in Theory and in Practice;" "Text-Book of the Materials of Construction;" "History of the Steam Engine."

The Steel Car Suits.

At Pittsburgh the court has handed down a decision in the case of the Pressed Steel Car Company against J. M. Hanson, president; C. F. Culverhouse and William Bierman of the Standard Steel Car Company, who were charged with appropriating blue prints or drawings of steel cars made while in the employ of the plaintiff and owned by the Pressed Steel Car Company. The defendants in their defense claimed that the blue prints were common property; that they were the same as a catalogue and had no special value. This the court rules is incorrect. The court ordered the defendants to return these and other blue prints to the plaintiff company and to pay the cost of prosecution. The decision is an important one and establishes a new precedent—the right of a manufacturer to ownership of blue prints, drawings, &c., made for him by persons in his employ. The total number of blue prints in the present case was about 150. A master was appointed to ascertain what prints or copies thereof are now or have been since the filing of the bill in the possession of the Standard Steel Car Company, or in the possession of any of their officers, agents or servants. Culverhouse having surrendered certain bills of material taken by him from the office of the plaintiff company, it is ordered that the prothonotary, in whose custody the said blue prints of bills of material have been placed, shall deliver the same to the plaintiffs.

An Automatic Pneumatic Shifting Device.—E. F. Zitzewitz, president of the Sheffield Foundry Company, Chicago, has invented an automatic pneumatic shifting device for use on a motor driven air compressor in cases where the motor drives other machinery independent of the compressor. The device in use in his own plant automatically shifts the compressor belt from the tight to the loose pulley when 60 pounds' pressure is reached, returning it to the tight pulley when the pressure falls below 25 pounds. The range can be adjusted to suit requirements. The inventor, who has applied for a patent, states that his device is interesting the larger manufacturers of motors and compressors.

Acme Harvester Company Financially Embarrassed.

The Acme Harvester Company of Peoria, Ill., whose works are at South Bartonville, have been forced by slow collections to place their financial affairs in the hands of a committee representing their creditors. This committee consists of D. R. Forgan, vice-president of the First National Bank of Chicago; G. H. Burr, a member of the Boston brokers' firm of Stere & Burr; Ferdinand Luthy, president of the Merchants' National Bank of Peoria and of Luthy & Co.; Martin Kingman, president of the Illinois National Bank and of Kingman & Co., and A. G. Becker of A. G. Becker & Co., Chicago, large note brokers. Mr. Forgan states that the books of the Acme Harvester Company show assets amounting to $4,000,000, and liabilities of about $2,000,000. He said:

"Business will be continued by this committee for the purpose of liquidation; or, in other words, until we have paid the debts of the company. Then the owners of the company may continue or not as they see fit. The plant is now temporarily closed down, as it is every year at this time, in order to get ready for the coming season's business. It will be started up shortly, when we will work up all the materials on hand into machines. Assets of $4,000,000 are shown on the books, but when it comes to paying debts with book assets the latter are apt to shrink. The continuance of the plant depends a good deal on the attitude of creditors toward the company."

Harry Bartlett, formerly of the Peoria National Bank, has been placed in active charge of affairs at the plant. A. G. Becker & Co., who are represented on the committee, are understood to have over $1,500,000 of the Acme Harvester Company's paper. Local banks in Peoria have only a comparatively small amount.

The Acme Harvester Company was started many years ago as the J. Hodges Header Company at Pekin. Control of this company was bought by W. H. Binnian and W. E. Stone of Peoria, at which time the firm name was changed to the Acme Harvester Company. On the death of Mr. Stone his interest passed into the hands of his estate, and his son, H. C. Stone, became vice-president, and Oliver J. Hastings, secretary and treasurer.

About two years ago the present plant at South Bartonville was erected at a cost of over $500,000. It is one of the larger implement plants of the West, and is admirably equipped for the purpose intended.

The Acme Harvester Company state that their financial embarrassment is due to difficulty in making collections, owing to the stringency of the money market, and to the fact that heavy and continuous rains in the territories where their largest business lies have prevented threshing of grain and made it impossible for farmers to meet their obligations. This industry is one of great importance to Central Illinois, as it employs about 1000 men, and has been shipping machines to every part of the world, a large portion of the trade being on the Pacific Coast of this country and on the large farms of South America. Their lines include headers, binders, mowers, hay rakes and similar tools.

The Acme Soft Center Steel.

C. R. Stephens, superintendent of the Moline Plow Company, Moline, Ill., has purchased the controlling interest in the Acme Steel Company, whose plant is located on St. Louis avenue in Chicago. The steel manufactured by this company is a special product, which is used entirely by the implement manufacturers for plow shears, mold boards and cultivator shovels, sweeps and shapes. It is a soft center product, made by converting in special apparatus and in patented furnaces soft Bessemer or basic open hearth slabs. The ability to introduce into both surfaces of the slab for any required depth such an exact amount of carbon as may be required for the purpose makes it possible for the company to obtain a product which they state is in every way as commercial as the standard 3-ply soft center steel. The total quantity of this class of steel used in the United States is over 20,000 tons per annum. The company expect to have the capacity of their plant increased before the first of the year so that they can take care of 10,000 tons of this business. Nothing in the line of new machinery is necessary, everything being already installed, with the exception of additional furnaces, which they erect themselves. Their shearing room possesses sufficient capacity to shape 10,000 tons per day. This steel is not a new invention, having been produced to some extent for many years, but the company state that it has never been successfully made except by them. The difficulty in previous attempts has been the inability to make two pieces alike. They guarantee to make it all alike.

M. H. Treadwell & Co.'s Lebanon Plant.

Since assuming control of their plant at Lebanon, Pa., January 1, 1901, M. H. Treadwell & Co. of New York, have modernized the equipment and enlarged the buildings to the extent that the output has been practically doubled and the plant of to-day covers 7 acres.

The works were erected about 1867, and were formerly occupied by the Lebanon Mfg. Company, who did an extensive business with furnaces and railroads in that section. The buildings were destroyed by fire in 1873, but were immediately rebuilt and operations were resumed in 1874. The present foundry was built in 1886, and the buildings then occupied by the foundry were taken into what is now the machine shop. The plant extends from Tenth to Eleventh streets, and is bounded on the north by the Philadelphia & Reading and on the south by the Cornwall & Lebanon Railroad. The buildings comprise a foundry, machine shop, forge shop, erecting shop, pattern shop, wood working shop, crane and paint shops and a large and spacious office, all of which are modernly equipped for their respective purposes.

The foundry has a capacity of 50 tons of castings per day and is equipped with pneumatic tools and two traveling cranes, the latest installation being a 25-ton electric crane, designed and constructed in their own shops. The machine shop, which is 60 x 200 feet, has been especially equipped for heavy work, and a number of new tools, such as planers, boring mills, double axle lathe, drill presses, air compressor, &c., have been recently installed. All the heavy machinery in this department is electrically driven. The company have decided to remodel the machine shop and rearrange the machinery. To this end a crane runway will be erected on which will be operated two 15-ton cranes of their own design. This runway will extend through the shop 150 feet and will greatly facilitate the handling of material. The galleries on the sides of the shop will be used for the light machinery, and at each end will be located electric elevators to raise the stock and lower the finished product to the main floor. A standard gauge track, also a narrow gauge track, will extend the full length of the building, making it possible to load and unload all material directly on the main floor. A complete new power plant has been installed and many new machines have been put into the forge shop and other departments, while the pattern shop is to be equipped with a new band saw, scroll saw, planer and jointer.

At this plant the company have done a large amount of work, including the building of over 533 railroad cars, a large number of Tread-Kill cinder and hot metal cars, 27 slag cars for smelting plants in Mexico, and a great many cars of various designs and capacities for the steel works in the Pittsburgh district. Besides castings, of which a large amount of the heavier class has been turned out at this plant for steel works throughout the country, roll bending machines, gas producing machinery, tanks &c. are produced.

The general sales office is at 95 Liberty street, New York, with branch offices in Pittsburgh and Philadelphia. The officers are J. H. Killinger, president; H. N. Dougherty, vice-president; John Hunsicker, treasurer; W. I. Gassert, secretary, and P. N. Killinger, superintendent.

The National Steel Foundry Company, New Haven, Conn., announce the establishment of their acid open hearth steel casting plant. December 1 is the date set for the first pouring.

The Sturtevant Foundry.

The new foundry and pattern shop of the B. F. Sturtevant Company at Hyde Park, Mass., is one of the best recent examples of the careful adaptation of the methods of modern foundry practice combined to fulfill the needs of a particular line of manufacture. The engineers of the company made a careful investigation of methods followed in other modern plants and succeeded admirably in carrying out adapted ideas in their own new plant.

The foundry is a part of a great plant now practically completed, but only the foundry and pattern and flask shops are in operation. For several years the Sturtevant Company have contemplated the erection of a new plant to replace the present works at Jamaica Plain, Mass. The fire which visited the propery in 1901 definitely decided the matter, and now the plan is about to reach complete fulfillment. The new plant, of which the foundry is an important unit, is upon a site selected admirably adapted for the requirements. The tract of land contains over 15 acres and has a frontage of 1300 feet along the freight yard tracks of the New York, New Haven & Hartford Railroad, near its station at Readville. The water supply is ample, and the space for dumping waste is sufficient to meet all requirements for years to come.

The plant comprises a commodious four-story office building, measuring 45 x 125 feet; a three-story building, 300 x 800 feet, devoted to the manufacture of blowers, heaters and galvanized iron work; a building 80 x 250 feet, of the same hight, on the first floor of which all engines will be tested, stored and shipped, while the other floors will be utilized by the electrical department; a general machine shop, measuring 120 x 500 feet, with 40-foot side galleries, devoted principally to the building of engines; a forge shop, 40 x 100 feet; a two-story building of the same floor area devoted exclusively to lockers, washing and sanitary facilities for the employees; a pattern and storage building, 80 x 150 feet in ground plan; a foundry measuring 170 x 350 feet; a power house, 80 feet square, with detached fire and service pump house. All told, the aggregate floor area of the buildings exceeds 9 acres. Brick has been used for all walls; steel columns and girders form part of the construction of such buildings as are equipped with traveling cranes; all upper floors are of plank with top course of maple laid on heavy wooden beams, and designed in the case of the principal buildings for carrying safe loads of 200 to 250 pounds per square foot. The roofs are of heavy plank, covered with tar and gravel.

In the arrangement of the buildings careful study was given the matter of intertransportation. Spur tracks permit of ready handling of incoming and outgoing freight, while a complete system of industrial railways connect all departments, including the yards. The industrial system is equipped with 12-pound T-rails, laid 24 inches gauge on centers, with turntables, trucks, &c., all of which were specially designed and made by the Sturtevant Company. Sturtevant motors are used throughout the plant.

Before the completion of the new power house a temporary plant was established in the foundry building. This comprises a locomotive boiler, draft for which is produced by a Sturtevant induced draft fan, and two 75-kw. Sturtevant generators, driven by two Sturtevant 13 x 12 horizontal engines, which furnish direct current at 220 volts. This is utilized both for power and for arc and incandescent lighting throughout the plant. The entire transmission equipment, including motors and hangers, is of Sturtevant manufacture.

The pattern building is divided midway of its length by fire walls, inclosing stairs, elevators, &c. One-half of the building, with stories respectively 17 and 15 feet, is devoted to the flask and pattern making rooms, while the other half, provided with intermediate floors, making four in all, is utilized for pattern storage.

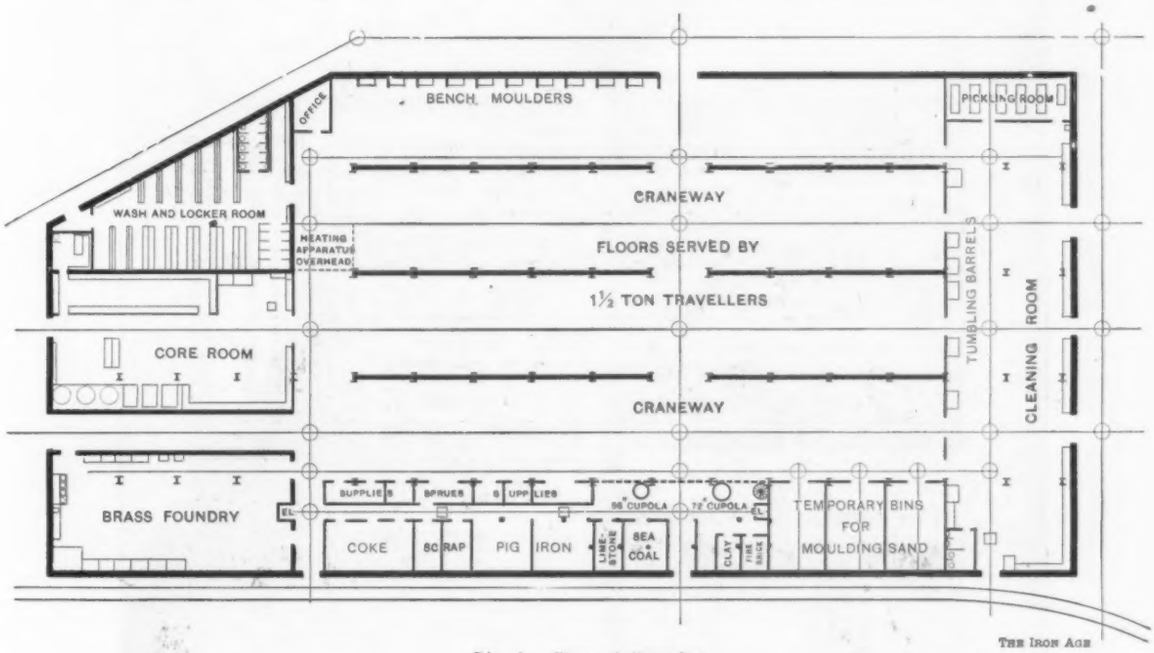


Fig. 1.—Plan of Foundry.

THE STURTEVANT FOUNDRY.

The flask shop, measuring about 60 x 80 feet, is equipped with band, cross cut and splitting saws, boring machine and lathe, all driven by a 10 horse-power motor suspended from the ceiling. The industrial railway runs directly into this room from the foundry, across a distance of about 40 feet, and together with an overhead transfer track reduces to a minimum the cost of handling flasks. The lumber for their manufacture is unloaded from cars directly in front of the building. This room also includes the metal pattern makers' department, equipped with the necessary machine tools. Adjacent thereto is the locker, wash and toilet room for the building.

The Pattern Shop.

Immediately above is the pattern shop, abundantly lighted upon three sides and equipped with a full complement of tools, including one single and two double saw benches, two band saws, a buzz planer and a double surfacer, five lathes, one of which is a 66 x 11½ inch gap lathe, a drill press, a core box machine, numerous wood trimmers, &c. All the power machines are operated by

two 10 horse-power motors, both not being required for ordinary work, but one always serving as a possible relay in case of accident.

The benches, which accommodate two men each, and measure 2 feet 6 inches in width by 16 feet in length, are so arranged along the sides of the building that the men all receive a left shoulder light. Behind each bench is a working table 4 x 16 feet in dimensions. The benches are supported upon cast iron legs of special design, which were built by the Sturtevant Company and are used throughout the plant. They are equipped with Emmert vises, and their tops are of heavy maple plank. A warming chamber for glued work is provided, which receives warm air through the general heat flue from a Sturtevant heating apparatus below.

Around the pipe columns which support the floors of the pattern storage end of the building are clamped the pattern shelving brackets, which are adjustable to any hight, as shown in Fig. 2. All patterns are consecutively numbered upon the drawings as made. When delivered to the pattern storage department proper locations are assigned, and records thereof made upon cards one for each pattern. These cards are filled in the order of the pattern numbers. Four figures with the addition of a letter are in every case sufficient to locate a pattern. A given location, for instance, may be 2125B—that it. it is upon the second floor—as shown by the first numeral, 2, it is in the twelfth row of shelves, and the third division of that row, as shown, by the succeeding numerals 125 and on the B level; the floor being designated A, and the letters B, C, D, &c., indicating the shelves in their order above.

The first floor is of concrete, and is designed for the keeping of heavy cast iron patterns. It is served by an industrial railway and turn table, which permits of transfer to the elevator and thence to other floors. Communication between the pattern shop and storage department is direct, while the fire risk is reduced to a minimum by a double system of fire doors.

The molder's written order to make a specified number of castings is issued by the foundry office, directly to the pattern keeper, who makes record thereon of the pattern location, attaches it to the pattern and sends both to the foundry. A metal clip placed upon the storage record card indicates that the pattern is out.

The Main Foundry.

The main foundry, Fig. 1, has two long craneways, each 35 feet in width, with center bent of the same width and side floors 30 feet wide. The brass foundry, core room and wash room are located at one end; the charging floor at one side, nearly midway of the length, and the cleaning room at the other end. The craneways are designed for 20-ton electric traveling cranes. Those already installed are of the Whiting Foundry Equipment Company's make, and are equipped with Sturtevant motors.

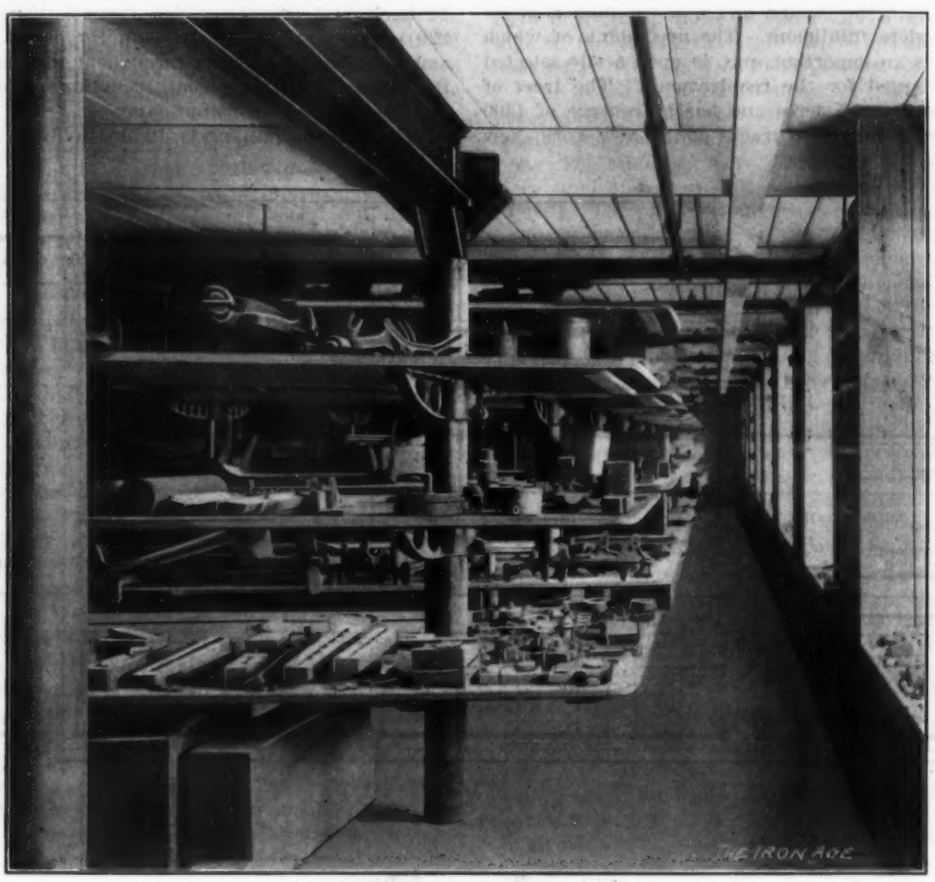


Fig. 2.—Adjustable Shelving in Pattern Shop.

THE STURTEVANT FOUNDRY.

Brick division walls 3½ feet high, running lengthwise of the foundry, separate the floors on the lines of the column, as shown in Fig. 3. Lighting is secured through monitors in both of the craneways and through ample side windows. Each line of monitor transoms is operated in unison by a novel device installed by the G. Drouve Company. The western side of the foundry is given up to bench and small floor molding, the bench molders' floor being separated at the bench ends by wooden partitions. The floors throughout this side of the building, as well as those in the storage bins and center runways, are of concrete. Alongside the industrial railway, which serves iron from ladle trucks to the bench floors, is a sunken trench laid with common brick as a suitable place for drippings and for the piling of hot castings.

In the center line of each of the craneways and in the bent between them runs an industrial railway, with turn tables connecting with the cross aisles, which provides for the distribution of metal, &c., to all parts of the building. The floor between the craneways is supplied

with a series of 1.5 ton small traveling cranes of about 10 feet span, equipped with Sturtevant electric hoists built especially for this work.

All materials are received from a track which runs along one side of the foundry, and are delivered through wall openings to the bins, which fill a portion of the side wing adjacent to the cupolas. For the present the sand storage bins and mixing room are also within this building.

A system of charging has been devised, under which the charging cars pass at floor level in front of the bins, are there loaded with the requisite amounts, weighed and passed to the elevator, where they are raised to the charging floor. As each car is unloaded it is pushed forward and started down an incline whence it passes back in a direction opposite to that traversed while being loaded on the floor beneath. Apparatus and an elevation in the incline gradually bring the car to a standstill and then release it so that it may, by its own weight, roll onto an elevator which is automatically tripped and descends to the ground floor level. Here it is removed by one of the loading men and the elevator returned to its place ready to receive another load.

The two Whiting cupolas are 56 and 72 inches in diameter. The opportunity has been improved to show the adaptability of the Sturtevant pressure blower, a No. 8 and a No. 10 blower, driven respectively by 30 and 40 horsepower Sturtevant belted motors, being supported upon the charging platform through which they discharge directly downward and thence to the cupolas. It is intended to make this installation the subject of critical experiment for the establishment of important principles.

The entire transportation equipment of the plant, including tracks, cars, trucks, &c., was designed and built by the company. The tracks in the foundry are imbedded in the concrete runways, and all changes of direction are secured by turn tables, there being no switches in the works, and therefore no radial truck cars, all cars having rigid bases. The turn tables are designed very heavy to avoid distortion or breakage, and consist of a bottom frame with four roller wheels, which are carried upon composition trunnions, and a cover, which is recessed for crossing tracks at right angles and provided on the underside with a chilled tread with which the wheels come in contact. A small idler wheel is provided which automatically stops the turn table on each quarter but readily releases it. The cover is accurately centered by a chilled conical bearing.

The cars are provided with a special type of ball bearing wheel, practically devoid of machine work but with chilled wearing surfaces. The ordinary flat cars, as well as the charging cars, are built up of structural steel. The geared ladle cars have malleable iron frames and inclosed spur gear mechanism. Similar construction is employed in the transfer cars for geared crane ladles of medium size, while a simple low platform truck is utilized in the case of the largest crane ladles. The dump cars are in the form of inverted cones, and so balanced as to be tipped with the utmost ease. The taper of the cone is such that these cars are practically self dumping.

The Brass Foundry.

The brass foundry, located at one corner of the main building, has four crucible furnaces and a special form of reverberatory furnace designed principally for the melting of babbitt or similar soft metals. An overhead traveler, with interlocking transfers on the side floors, serves the entire area of the room. Blast for the furnaces is furnished by a No. 3 Sturtevant Monogram blower, and the entire machinery consisting, in addition, of a sprue cutter, a magnetic separator, a tumbling barrel and emery wheels, is driven by a 3 horse-power Sturtevant motor attached to the wall. The entire floor is of concrete, in which is imbedded a section of the industrial railway communicating with all parts of the foundry.

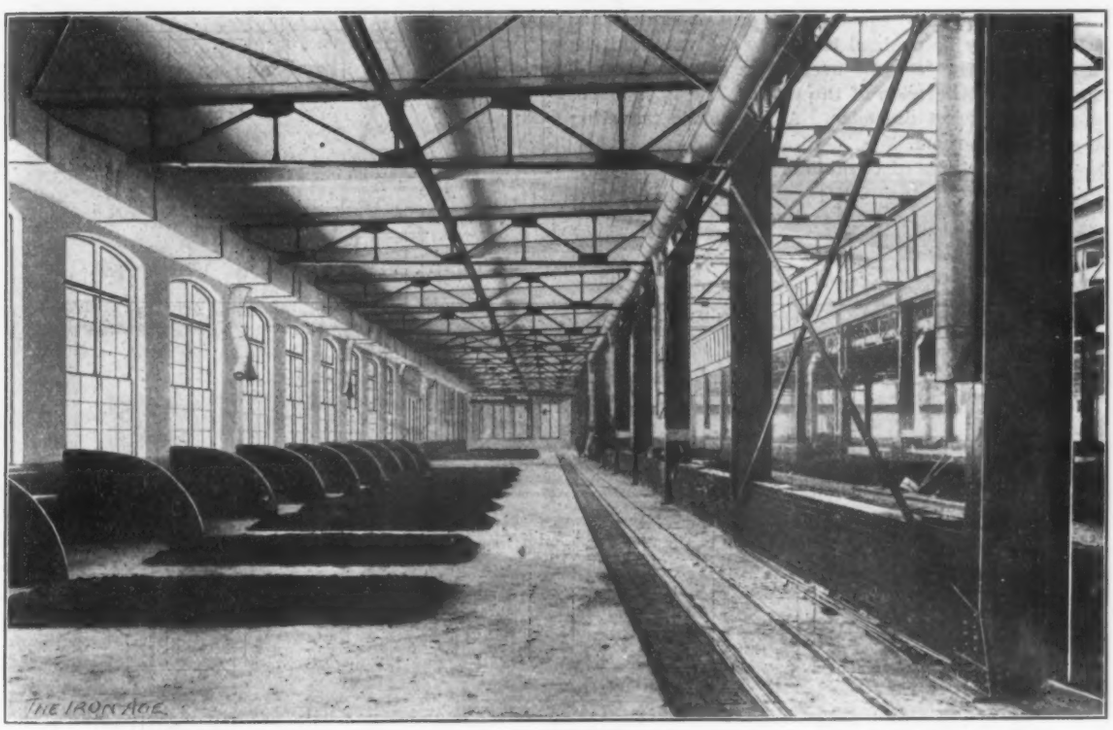


Fig. 3.—General View of Foundry.

THE STURTEVANT FOUNDRY.

The Core Room.

In the middle of the end of the foundry is the core room. The ovens, shown in Fig. 4, are six in number, three being 7 feet in diameter, of the reel type, and three being respectively 4, 5 and 7 feet in width by 8 feet 10 inches in length, provided with cars. An overhead traveling crane serves these latter ovens and provides for the transfer of heavy cores to the industrial railway. A portion of the room is partitioned off and serves for the women core makers, a number of whom are employed in this department. The floor is of concrete. The tops of the ovens are utilized for storage of cores upon a special rack of steel construction. A Blake wire straight-

ener, together with a Hanna automatic shaker, are the principal machines in this room.

The Cleaning Room.

At the other end of the foundry is the cleaning room, through which run the longitudinal tracks from each main aisle of the foundry. A 5-ton three-motor electric crane of the Whiting Foundry Equipment Company's manufacture, equipped with Sturtevant motors, serves the principal portion of the floor in this room. The tumbling barrels, six in number, are completely inclosed in housings of steel construction. These, together with a Sly cinder mill and several emery wheels, are driven by a 30 horse-power Sturtevant motor. A temporary air compressor, located in one corner and driven by a Sturtevant motor, supplies air at 100 pounds pressure to chippers, stokers, hoists, &c., employed in connection with this work. The light and ventilation of this room are exceptionally good.

The Pickle Room.

Adjacent to the cleaning room is the pickle room, Fig. 6; the floors of both are of concrete. The pickle beds are of teeter board construction, Fig. 7, so designed that the acid may be drained back into the vats and the board subsequently teetered over for washing into the trench upon the other side of the room. The floor slopes so as to give perfect drainage. A pneumatic traveling crane serves this room.

One of the features of the foundry is the sanitary arrangement. The department has a large locker and wash room. Expanded metal lockers to the number of 225 are already in position. Enameled iron sinks, six in number, are served with tempered water, and are freely patronized by the employees, the custom growing among them. A series of slate partitioned shower baths proved very acceptable during the past summer. The floor of this room is of tar concrete; the upper walls and ceilings, which are white and fresh, are in pleasing contrast with the steel work and base of the walls, which are finished in dark green. Within the same room is installed the time recording system, so placed that a double line of men pass, one upon either side of the board, as they go and come. The foundry foreman and his assistants are provided with a well lighted office.

Naturally the entire plant is heated and ventilated by the Sturtevant system. In the case of the pattern building, the apparatus, consisting of an engine driven fan and steel pipe heater, is placed close to the division wall and delivers the heated air into a vertical flue and thence to the various rooms. The foundry apparatus is located overhead in the end of one of the craneways, and arranged to take fresh air from out of doors or return from the building and reheat it. Distribution of air is made through a system of overhead galvanized iron piping, dis-

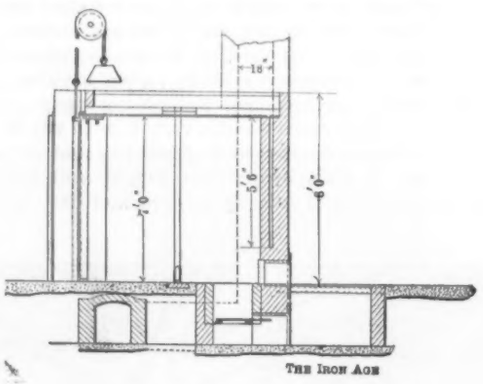


Fig. 5.—Section of Core Oven.

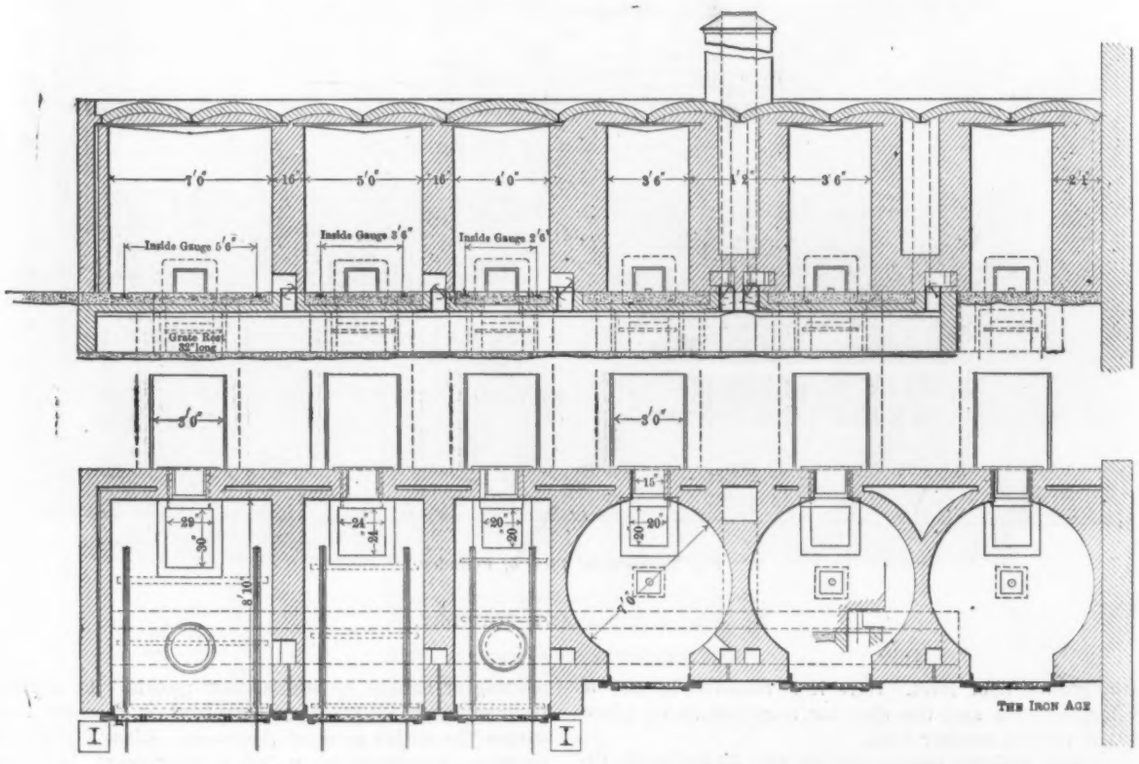


Fig. 4.—Plans and Vertical Sections of Core Ovens.

THE STURTEVANT FOUNDRY.

charging downward to the floor. Both apparatus utilize exhaust steam. A complete underground tunnel system is provided for distribution of steam, electricity, compressed air, &c., and return of condensation.

Checks were received on October 21 by members of the second United States Steel underwriting syndicate who had decided not to renew their agreement for nine months longer, as suggested by the managers, but who withdrew on October 1, as the terms of the original contract specified. This was the syndicate formed to underwrite the conversion of $200,000,000 of preferred stock into new 5 per cent. sinking fund bonds, as well as the issue of additional bonds for improvements, to a maximum of $50,000,000. The checks, it was reported, equaled be-

tween 6 and 7 per cent. on the amount of stock turned in, and represented the profits up to October 1.

The Atchison, Topeka & Santa Fé Railway confirm the report that they bought about 12,000 tons of steel rails from the Lackawanna Steel Company for delivery next spring. They withhold the price at which the purchase was made.

An effort is being made to secure the authorization of a bounty on the production of spelter in Australia. C. F. Courtney, manager of the Sulphide Corporation's smelting works, has made a statement in which he says that the contemplated bonus of £2 per ton on the first 10,000 tons of spelter made in Australia would be sufficient to establish the industry. On the Central dumps at Broken Hill, he says, there are 680,000 tons of material which could be turned into spelter. At present the Commonwealth only uses from 2000 to 2500 tons of spelter per annum, but if the industry was established the spelter would go to Europe for a market. At present they only manufacture 9 tons a week.

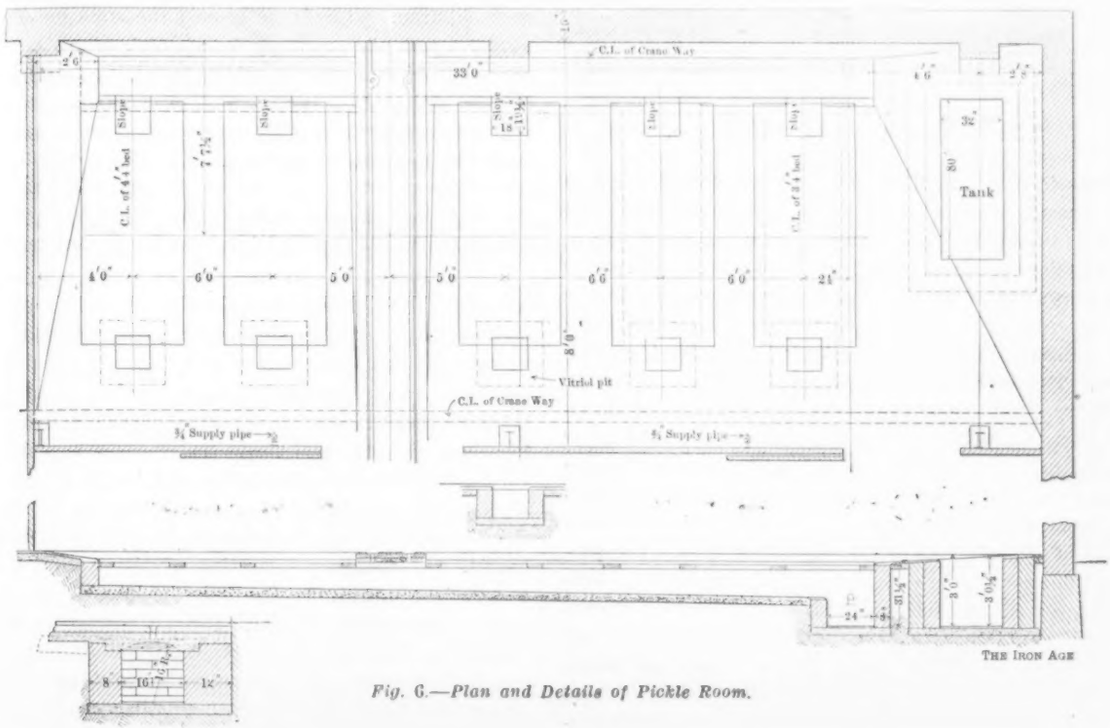


Fig. 6.—Plan and Details of Pickle Room.

Fig. 7.—View of Pickle Beds.

THE STURTEVANT FOUNDRY.

The Iron Age

New York, Thursday, October 29, 1903.

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The Open Shop as An Issue.

Coincidently with the issue of this number of *The Iron Age* there will assemble in Chicago the most important meeting ever called in this country for the discussion of the relations between employers and wage earners. It is the outgrowth of an informal meeting held in that city on September 29, at which was discussed the advisability of forming a national federation of employers' associations. The movement began some months ago, when D. M. Parry, president of the National Association of Manufacturers, made his now famous attack upon the trade unions, in principle and in practice. It at once became evident that the position taken by Mr. Parry was too radical to meet the views of the more conservative representatives of the interests of the employing class. The people of this country are not yet ready to denounce as dangerous, *per se*, and subversive of our institutions, the organization of labor to promote its own advantage and secure by every lawful means higher wages and better conditions of employment. But those who have much to do with labor recognize that the union movement is misguided and led into excesses, which if not checked and restrained in the only way in which it can be, by the organization of employers for their own protection and the safeguarding of the rights of invested capital, will produce conditions destructive of national prosperity and throw the whole industrial system of the country into hopeless confusion. Very few manufacturers are willing to be rated as opposed to the trade unions. Those who are wise and far sighted recognize that such opposition would be futile, and that if it were possible to disrupt existing unions new ones would quickly form in their place, and might be even more dangerous than those which have learned from experience that even concerted action cannot abrogate nor permanently suspend the natural laws, which sooner or later assert themselves and inflict their inexorable penalties upon those who disregard or violate them.

It must be confessed, however, that during the past 12 months public opinion has experienced a great change as regards trade unions. Many of those who have regarded with great toleration what they deemed the natural excesses of a young movement, and held the belief that with the first evidences of a lessened speed of revolution in the wheels of industry labor would become conservative, have at last reached a realizing sense of the fact that during our long period of national prosperity a great deal has happened of which they have had no just comprehension. They find that labor has reached a perfection of organization indicating a higher intelligence than it was credited with possessing. Behind the local union stands the central federation of unions, and behind this the national federation, with large resources and very unscrupulous agents. The autonomy of the local unions is apparently absolute up to the point of involving themselves in quarrels with employers, and when they have done so the formidable octopus of the national federation rises from the deep water and brings its many tentacles into play. It can mobilize the resources of a hundred union treasuries and concentrate their contents upon the winning of a local strike if any general advantage is to be gained thereby. It can nationalize the boycott to destroy the interstate trade of any offending employer. It has a large force of organizers, and when a point is to be gained it works patiently, thoroughly and with unfaltering purpose, organizing men, women and even children, and weaving around the often unconscious victim a web of conspiracy from which escape is impossible, but to surrender to which is fatal. To offset this system with one as perfect and to checkmate the influence of organized labor by an organization of manufacturers and employers as complete in every detail is the immediate objective of those who recognize the fact that the conditions which are the outgrowth of unopposed organization on the part of labor have become intolerable.

In calling at Chicago the meeting which is to lay the foundations for a national federation of employers' associations, those who are leading this movement may have in view the fact that Chicago under present conditions is an object lesson from which those who are studying the labor movement may learn a great deal. It is and has long been the principal storm center of trade union disturbances, and it is there that the battle of the open shop must be fought to a decisive victory for one side or the other. Just now the issue of the open shop is paramount. At the recent meeting of the National Civic Federation in Chicago the labor leaders from all the trades represented focalized their eloquence upon this one point. Mitchell, Gompers, White, Moffatt, Sullivan and half a dozen others came with carefully prepared papers showing why the open shop is impossible and why organized labor demands its abandonment. It was an interesting symposium, and instructive withal—not because the labor leaders said anything new or useful on this subject, but as showing that the word has been passed down the line that the existence of the present labor organizations and the tenure of their present leadership are dependent upon forcing the employers to enter into agreements providing that nonunion men shall be excluded from employment in shops in which union men graciously consent to work and against which, so long as it may please them to draw support therefrom, they will not launch the major excommunication of the combined strike and boycott.

This is the issue of the hour. If the open shop is sustained the work of the labor organizers to secure control of the industries has been in vain. The tendency of openness is steadily toward the crowding out of those who owe to their unions a higher allegiance than to their employers. It will be the one issue in defense of which the employers represented at the Chicago meeting will combine without dissenting voice. Fortunately, labor has itself raised this issue, and whether its present power will stand or fall depends upon whether it can defend or must surrender it. The formation of a national federation of employers' associations is rendered possible by the fact that all labor leaders want the closed shop, and all employers, whether they can get nonunion labor or not, stand for the open shop and will not surrender in principle the right to employ whom they will, even though they cannot at the moment avail themselves of it.

It is around this issue that the movement to form a national association of employers is crystallizing. The labor leaders see the danger which confronts them in this direction and are sending out warning circulars to those for whom they act, giving notice that there are troublous times ahead and to prepare for a keener trial of strength with employers than they have yet known. This is quite intelligible. After years of effort they have succeeded in organizing something less than 20 per cent.

of the wage earners of the United States. There their effort has exhausted itself. To dragoon the other 80 per cent. into line is impossible. If, however, the employers can be made the involuntary agents of this propaganda, and can be induced to close their shops and factories against nonunion labor, the matter will not be so difficult. Indeed, it might soon come about that 80 per cent. will be organized and only 20 per cent., more or less, be independent of union control. In some trades and in some localities this has already been accomplished. As a matter of fact, however, whether fortunately or otherwise, employers have waked up to a realizing sense of the danger of their position. Among them the demand for the open shop is practically unanimous, and it is in defense of this one proposition that the movement for the organization of employers is now becoming formidable.

If it be true that a union cannot exist in the free competition of the open shop, obviously there is something wrong with the plan on which it is organized or the objects to the attainment of which it is committed. If a union cannot show to those not in its membership a better reason for joining it than the threat that employers will be induced to discriminate against those independent of union control, such union is a failure and deserves to be destroyed as lacking any sufficient reason for being. The threat is at best a "bluff." It can never be made good. Chicago is and has long been the battle ground of the unions, and some of them have practically monopolized the industries they represent. But in every instance in which the question of the open shop has been made an issue the unions have been defeated. This is true even in trades in which it is impossible for the employer who may want to do so to employ nonunion men possessing characteristics of skill, good character and good habits. For the machine builders, the carriage makers, the metal workers, the blacksmiths, the supply houses, the picture frame makers, the managers of office buildings, the tanners, the manufacturers of leather belting, the trunk makers, the stock yard employers, the cloak makers, the laundry, hotel and restaurant proprietors, the candy makers and the employing freight handlers, the Chicago Employers' Association has established the open shop and forced the unions in written contracts to concede it. True, in a number of these trades only union labor is now available, but the right of employers to hire nonunion labor if they can find it exists and will not be surrendered. If the unions can be forced to concede this in Chicago, where the domination of organized labor is as nearly absolute as it is anywhere in the United States, it can be done elsewhere even more easily.

In making the open shop an issue the labor leaders have committed themselves to what seems to be a mistake. If it was not a mistake the fact is patent that they see the early dissolution of their whole system of organization, and have taken counsel of their fears rather than of their sound business judgment. It has given employers an issue upon which all can unite, and concerning which there is no room for intelligent differences of opinion in the present status of the labor movement. The Employers' Association of Chicago, which has never yet been defeated in a square contest with organized labor, has the following for its declared objects:

This association is formed to foster and protect the business interests of Chicago; aggressive only in maintaining the good name and progress of our city.

To unify the action of its members and affiliated associations upon those matters where a united and concerted action and a determined fixed policy may seem wise and necessary.

To secure for employers and employees the freedom of contract in the matter of employment, irrespective of whether or not an employer or employee is a member of any organization.

To oppose restriction of output, sympathetic strikes, and boycotts, which, through their frequency in the past in Chicago, have been a constant menace to its industrial progress.

To prevent any interference with persons seeking to work and earn a living.

To avert industrial disturbances; to harmonize differences between employers and employees, so that justice may be done to both sides.

To enforce the laws of the land.

Against the principles here enunciated organized labor will forever wage a losing fight. Its local triumphs will be short lived, and in the end will prove more disastrous than defeats. They offer a platform upon which all employers of labor can stand without crowding off any wage earner who values his independence and is not ready to surrender it. Given the open shop, freedom of contract and the enforcement of the law, and what remains of the riddle of the Sphynx, meaning the question propounded by organized labor, will answer itself naturally, frankly and without harm to those to whom it is propounded.

Bankers and the Currency.

One cannot read the report of the Special Currency Committee of the American Bankers' Association without recalling the report made last December by the Finance Committee of the New York Chamber of Commerce, partly because the reports, both made by eminent bankers, are in sharp contrast with each other in regard to currency legislation, and partly because one distinguished banker was a member of both committees. The report made to the American Bankers' Association in San Francisco contains evidence of being, not exactly a compromise, but an adjustment of divergent views. There was an effort to secure unanimity, but it was not successful; one member of the committee dissented from the recommendation that the limitation upon the amount of bank notes be repealed, and he did so on the ground that it was inconsistent to provide for an increase of currency and at the same time to ask for the repeal of a restriction upon its decrease. No point in the report would have seemed less calculated to impair the unanimity of the committee, and the ground on which it was objected to is doubly untenable. A scientific currency is one that contracts as well as expands to meet the varying requirements of business, and there is no inconsistency in favoring a measure of contraction in a plan for expansion, but experience has shown that the limitation of $3,000,000 a month upon the retirement of national bank currency has prevented, not contraction, but expansion. The fact that banks could not get their notes retired promptly when the need of them had passed has prevented them from issuing currency that the community was in need of. In his report last year Secretary Shaw said that he could have got the banks to put out $50,000,000 more circulation than they did if it had not been for this bar to the retirement of the notes after the stringency had passed.

The committee of the Chamber of Commerce was opposed to an emergency circulation on the ground that a stringency would become severe before the additional circulation would be issued, and it was important to prevent rather than to cure a stringency, and because the very fact of issuing an emergency circulation would create alarm. The committee of the Bankers' Association reported in favor of an emergency circulation secured by the deposit of bonds satisfactory to the Secretary of the Treasury and subject to a tax of 6 per cent. "to insure and hasten its return to the issuing bank." It may be seriously doubted whether a monetary stringency would be promptly remedied by the issue of notes if the banks had to put out their money for the purchase of bonds to deposit as security and then pay a 6 per cent. tax on the

circulation. The very low return on Government bonds has restricted the issue of notes under existing law, and the low return on any gilt-edged securities has impaired the avidity of the banks for public deposits at times when the banks could get high interest by lending their own money.

The committee of the Chamber of Commerce recommended that in addition to the present provision for the issue of notes secured by bonds, banks be permitted to issue notes to some fixed percentage of their capital upon their general and commercial credits. This would be an asset currency, grafted upon the present system, but in no long time it would replace it. The committee of the Bankers' Association did not mention asset currency by name, but it clearly disapproved of it, for it did not advise it, and it declined to "recommend any step that will tend toward a return to the miscellaneous circulation which prevailed in the country before the war, or any step which will disregard the history of finance among the commercial nations of the world." This language is not entirely just to the project for an asset currency, nor is it historically quite accurate. Many of the States had excellent banking systems before the Civil War, and the discrimination against notes issued in other States would soon have driven them to reform their systems. But the fact that every State had a separate banking system made a confusion in the currency that no one has proposed to restore. It is a fact to be repeated, because so constantly ignored, that the national bank system was not created to provide a safe currency, but a market for bonds, and the prohibitory tax on State circulation was not a part of the original law, but was an amendment to force the reluctant banks into the system. The national bank notes showed no disposition to drive the State bank notes from the field.

The tax on the emergency circulation is supported by the practice of Germany, but a large body of the most authoritative financial opinion sustains the Comptroller of the Currency in his statement before the New York bankers last December, that "it is shown by the experience of all countries and systems of currency that the main reliance for contraction should be redemption. It is more reliable than any tax restriction or regulation." This opinion is supported by the working of the Suffolk Bank system in New England before the Civil War, and by the practice of Canada now.

The report of the Finance Committee of the Chamber of Commerce reflects more accurately the sentiment of Eastern bankers and the conclusions of the authorities on financial science and history; the report of the Special Currency Committee of the American Bankers' Association shows some influence of the sentiments of portions of the country that have known nothing of bank currency between the "wild cat" currency of 1834 and the bond secured currency of 1864.

Unjust Criticism of Railroads.

The retrenchment which has been ordered on a number of important railroad systems is provoking undeserved criticism. Considerable loose writing is indulged in by the daily press, railroad managers being condemned for their alleged shortsightedness in mistaking a brief period of overwhelming business for a permanent condition of trade growth, and entering upon extravagant schemes of improvement which they now feel obliged to sidetrack. It is pointed out that in the same proportion that such projects unwarrantably aggravated the demand for labor, materials and money when the country's resources were already being overstrained, the business situation is now being adversely affected by the suspension of railroad improvements and the discharge of large forces of workingmen. This is grievously unjust. Such captious critics have very short memories. They completely forget the almost frantic appeals made for months for better railroad service. Merchants and manufacturers suffered seriously because of the inability of the best equipped systems to give them even reasonably prompt service. Railroad managers were accused of incompetency in not having prepared themselves in dull times for just such an emergency. Possibly they may have overestimated the normal transportation necessities of the country to some extent, but if so they have done no more than the manufacturers who have been expanding the productive capacity of their factories to keep up with the prodigious demand on them. The reaction we are now experiencing is undoubtedly a wholesome respite from the furious pressure of the past few years. It affords a breathing spell during which those charged with weighty responsibilities can take their bearings and make plans for the future with greater deliberation. Meanwhile the normal requirements of the country, which are ever increasing, may confidently be expected to grow up to the enlarged transportation facilities that have been mapped out.

The Canadian Iron and Steel Industry.

According to the statistics collected and published by the American Iron and Steel Association, the Canadian production of iron and steel has grown considerably within recent years. The figures are as follows for the period beginning with 1895:

Years.	Pig iron. Gross tons.	Steel ingots. Gross tons.	Rolled iron and steel. Gross tons.
1895	37,829	17,000	66,402
1896	60,030	16,000	75,043
1897	53,796	18,400	77,021
1898	68,755	21,540	90,303
1899	94,077	22,000	110,642
1900	86,090	23,577	100,690
1901	244,976	26,084	112,007
1902	319,557	182,037	161,485

The production has been somewhat stimulated by the bounties paid by the Canadian Government. These bounties have been sufficiently large to secure prominent attention in every prospectus issued by a promoter of an iron or steel enterprise. The system was inaugurated in 1883, when $1.50 per ton on pig iron was authorized by the Dominion Parliament. In 1889 the rate was reduced to $1, but in 1892 it was increased to $2. In 1894 the system was extended to puddled bars and steel billets, on which $2 per ton was authorized. In 1897 the rate was raised to $3 on pig iron on the proportion produced from Canadian ore, and maintained at $2 on the proportion produced from foreign ore; to $3 on steel ingots made of not less than 50 per cent. of pig iron made in Canada, and to $3 on puddled bars made from Canadian pig iron. These bounties are to be gradually reduced under the provisions of the act of 1897, as amended this year, as follows: From July 1, 1903, to June 30, 1904, a bounty of 90 per cent. to be paid; July 1, 1904, to June 30, 1905, 75 per cent.; July 1, 1905, to June 30, 1906, 55 per cent.; July 1, 1906, to June 30, 1907, when these bounties are to cease, 35 per cent. This year, however, a bounty was authorized indefinitely of $6 per ton on wire rods, $3 per ton on structural shapes not under 35 pounds per yard, and $3 per ton on plates not less than 30 inches wide and ¼ inch thick, when sold for consumption in Canada. Since 1894 the province of Ontario has paid an additional bounty of $1 per ton on all pig iron produced in that province. It will be observed that the great increase in production in 1901 and 1902 occurred under the operation of the maximum bounty.

The enlarged production of pig iron in 1901 and 1902 was due to the entrance into the field of the Dominion Iron & Steel Company, Sydney, Nova Scotia, and the great jump in the production of steel in 1902 was due to the operations of that company and the Algoma Steel Company, Sault Ste. Marie, Ontario, one of the subsidiary companies of the Consolidated Lake Superior Company. The Dominion Company, operating an open hearth plant, began to make steel on December 31, 1901, and the Algoma Company, operating a Bessemer plant, began to turn out steel on February 18, 1902. Other, but much smaller, steel plants contributing to the output in recent years are operated by the Nova Scotia Steel & Coal Company, New Glasgow, Nova Scotia; Canada Switch & Spring Company (now the Montreal Steel Works), Montreal, and Hamilton Steel & Iron Company, Hamilton. At the close of 1902 Canada had 14 blast furnaces, with six more partly built, and it had 19 rolling mills and steel works, with another steel plant under construction. The annual capacity of the blast furnaces built and building in Canada at the close of 1901 was placed at 1,090,300 gross tons of pig iron, and of the steel works at 838,400 tons of ingots; while the capacity of works making rolled products of iron and steel was placed at 981,900 tons.

The figures of production and capacity are quite imposing, especially the latter. The statistical showing is certainly flattering to Canada. But, unfortunately, the statistics do not tell the whole story. The steel production of 1902 was swollen by the output of the Algoma Steel Company, whose Bessemer converters ran for a few months in that year, producing 44,537 tons of ingots. Since that time they have been idle, and the financial troubles of the parent company, the Lake Superior Consolidated, make resumption quite uncertain, with a possibility that the steel plant may not be operated after the reorganization is effected. The Dominion Iron & Steel Company's plant is in regular operation, but that it is not yielding the profits expected is shown by the suspension of dividends, despite the large bounty earned. Upon these two companies the hopes of Canadians have rested for the development of the iron and steel industry on a large scale. It is not surprising, in view of the circumstances, that a pessimistic feeling is showing itself across the border. W. F. Maclean, for eleven years member of the Dominion Parliament from Ontario, is thus quoted by a Toronto newspaper:

> Canada is face to face with the painful truth that her iron and steel industries have not been a success. This does not mean that great iron and steel industries cannot be established in Canada. It does mean, however, that the plain facts should be revealed, no matter how much the revelation costs. Can Canada produce iron and steel to advantage? This is the question that is brought home to every Canadian to-day. Something is wrong at Sydney and something is wrong at the Sault. What is the matter? We have the coal and iron ores and presumably every adjunct to the manufacture of steel. The fault may be in the quality of some of these materials or it may be in the management of the enterprises that so far have failed to get on a solid footing.

The Canadians have striven heroically to develop their iron and steel resources, and deserve much credit for what they have done. In the last fiscal year the bounties paid amounted to about $1,250,000. This is a large sum for a country like Canada to pay for fostering an industry. If the results this year do not show a substantial advance over 1902 it would not be surprising to find the opposition to the bounty system very much stronger.

On October 23 an electric car in the high speed experiments on the Marienfelde-Zossen line, in Germany, attained the speed of 130.4 miles per hour. This beats the previous record, made about three weeks ago, by nearly 5 miles.

The Open Shop.*

BY HENRY C. HUNTER, NEW YORK METAL TRADES ASSOCIATION.

An open shop is a shop wherein the proprietor hires workmen irrespective of their membership or nonmembership in a labor union. Wages are arranged by mutual agreement between the proprietor and each individual workman; or a number of the workmen, or all of them, may be members of labor unions, and he may deal with them through the accredited officers of their unions, but he never, by agreement or otherwise, surrenders his right to hire nonunion workmen. This is understood briefly to be an open shop; at least that is the open shop that prevails in the New York Metal Trades Association.

A closed shop is a shop wherein the proprietor agrees with a labor union, or a number of labor unions, in case there are more than one trade employed, to hire only workmen who are members of the labor union, or unions, with which the agreement is made. The closed shop in the United States involves a further condition, that the labor union with which the agreement is made must be a labor union recognized as such by the American Federation of Labor.

The nonunion shop is the antithesis of the closed shop, and is one where the proprietor discriminates against union workmen. The union shop is one where the union workmen discriminate again nonunion workmen.

Let us take for our example a manufacturer of lathes, and let us assume that he has a closed shop and in all the departments of his factory only members of labor unions are at work. It may be forced upon him by the workmen being well organized, or it may come from his own volition, believing that it is to his pecuniary advantage to have his shop a closed one. Whatever may be the reasons, we will admit that it exists.

Now the cost of the production of lathes includes, among other things, material and labor. In the ordinary transactions of his business the manufacturer is required to deliver to his customers lathes at fixed price, and he must deliver them at such times and places as may, by contract, be agreed between himself and his customers, or if no date for delivery is fixed then the delivery must be within a reasonable time. He can contract with the seller of materials to deliver him at such times and at such places as agreed between them the materials necessary for the manufacture of lathes, and on the price thus agreed upon between him and the seller of material he can, in so far as material is concerned, estimate the cost of his lathes and fix the prices for which he agrees to deliver them to his customers. If for any reasons the seller of the materials fails to fulfill his contract for the sale and delivery of materials he will be liable to respond in money to the manufacturer for the damages thus sustained, and in like manner the manufacturer must fulfill his part of the contract by paying the price fixed between him and the seller upon the delivery of the materials. Here are corresponding obligations backed upon each side by corresponding responsibilities. The price of material may go up or down in the market, but whatever the conditions are the seller must fulfill his contract or in default pay the manufacturer the damages he suffers.

The Labor Side in the Cost of Production.

Let us now turn to the labor side of the cost of production. It may be a cold blooded proposition to place labor in the same category with material, but in the present state of the business world competition is the determining factor, and when a manufacturer sits down to estimate the cost of a lathe, the amount of labor required to produce it is resolved into dollars and cents, and these are added to the cost of material to determine the cost of production. Stability in the market of labor is absolutely essential to the successful conduct of a business engaged in the manufacture and sale of lathes or of any other product, as stability in the market of material. If there is a lack of sentiment in this statement it is the fault of the social system under which we live and not

* From a paper read before the Chicago meeting of the Civic Federation.

that of the manufacturer. Therefore, the manufacturer is justified in saying to the labor unions as he says to the seller of materials: "If I make a contract with you, can you deliver the goods, can you deliver them for a definite price, and can you deliver them when and where I want them, and in case you can't fulfill your contract, are you in a position to respond in money for the damages I shall sustain by your default?"

Conditions in a Closed Shop.

We have conceded that the manufacturer has a closed shop. Let us next examine the condition of this shop. The shop is run strictly under union rules. Here are a few rules from the constitution of one of the most important trade unions employed in the manufacture of lathes:

"The following ratio of apprentices shall be allowed: One to each shop, irrespective of the number of members of the trade employed; one to every five members thereafter.

"No member shall operate more than one machine or accept work by the piece or premium system.

"Each lodge shall establish a minimum wage in its locality, and no member of the organization shall work under that scale.

"Should a member vacate a position that was paying more than a minimum rate paid to his class, any member accepting such position shall, within 30 days, receive the amount it formerly paid.

"When a member wishes to withdraw through being appointed a foreman or superintendent, he may be furnished with an honorable retiring card, provided his salary be not less than $3000 per annum."

All these rules have been enacted without consultation or the approval of the manufacturer, or without regard as to whether the economic conditions of business can stand them, or whether his competitors in the same field are working under the same conditions.

We thus find men in almost absolute control of the shop, whose only responsibility is to complete the work of an hour, or a day, or, at the most, of a week. The manufacturer, on his part, must furnish the money to pay the wages, provide the shop with safe machinery, on which the workmen are employed, and must respond in damages for the injury sustained by an employee through defective machinery. In addition to all these obligations the manufacturer is alone responsible to his customers for the efficiency of the lathes.

The condition of the shop is thus in strict conformity to the ideas so well expressed by the president of one of the leading labor unions in the country in his address to the recent convention of this union, as follows:

"Those who have watched the trade union movement closely must realize that a rapid change has taken place; that the tendency of organized labor is toward the complete control of an industry. It is now up to the International Association of Machinists to take complete charge of the machine shop."

Illustrations of Recent Happenings.

An event in the factory of a member of the New York Metal Trades Association will illustrate the closed shop in its extreme. This member is a practical mechanic, having worked up through the ranks to the position of manufacturer. He owns his plant and everything in it. One day a few months ago he was at work in his factory on his own material, using his own hammer, when in walked a business agent and ordered him to stop working, and said that if he needed a workman a union mechanic would be furnished, and that if he continued to work his workmen would be ordered out on strike.

We will assume that the shops of the factory are running along peaceably. No disputes have arisen so far between the manufacturer and his union workmen, or if disputes have arisen, then they have been adjusted. The proprietor, however, decides to purchase a new engine for his plant, and accordingly he closes a contract with Mr. Smith, a manufacturer of engines in Philadelphia, for the delivery of an engine. The engine is completed, but before Mr. Smith ships it to New York a strike occurs in his shop by one of the recognized union trades, and subsequently Mr. Smith is put on the unfair list. He ships his engine to New York to be delivered to our manufacturer. What happens? The manufacturer is waited upon by a committee, probably from his shop, members of the union in which the strike prevails in Philadelphia, and he is informed by this committee that if that engine is put in the factory the members of the committee and their co-employees at work in his shop will strike. He may say to the committee: "I know nothing of the merits of the quarrel between Mr. Smith and his employees. I could not settle it if I so desired. The contract for this engine was made before the trouble occurred, and Mr. Smith can compel me to pay for the engine. It is absolutely necessary for me to put this engine in my plant to enable me to fill my orders."

He may also remind the committee that he has an agreement with their union. This committee, if it follows the action pursued under almost similar circumstances in New York, will say that this matter is a question of the organization; that the union has ordered the men to go out on strike if that engine is set up in the factory.

Again, suppose that it is necessary to send out from the factory mechanics to work in another factory where a strike exists, to make repairs or to set up a lathe which the manufacturer is under contract to perform. Here again the men will refuse to work if there is labor trouble in that factory.

Frequently the manufacturer finds half his men on strike in the shops over a wrangle as to which trade shall do a certain piece of work. I could go on almost without end giving examples of these serious annoyances, the causes for which the proprietor is in no way to blame for, and over which he has no control. No matter how expensive these disputes may be to the proprietor, the mechanics never assume any of the financial loss that accrues. These, however, are the petty, often ridiculous, but nevertheless expensive, incidents of the closed shop.

Restriction of Output.

Then there is the deliberate and systematic restriction of output, which prevails in some trade unions more than in others. And what is worse even than this restriction is the loafing that prevails in some of the large shops. I saw the other day a report recently made to the management of one of the largest shops in the vicinity of New York by a man who has made a thorough investigation of the loafing in this shop. The report showed men asleep, others reading newspapers, two or three men engaged on a piece of work that one of them could easily perform and many other acts that are comprehended within the meaning of the word loafing. It was a shocking and lamentable condition. The management of that shop does not dare to cause a dismissal of these workmen, which would be almost wholesale, because it would result in a strike; or if not in a strike, in their being obliged to hire other workmen of the same union and possibly friends of the men dismissed. This management will not have to endure either of these conditions; instead they will close their plant for no other reason than that their workmen are loafers. Suppose one of the contracts with a labor union, whose members are at work in one of the departments of the factory, expires and a demand is made for a scale of increased wages—a scale that has been determined by this labor union without regard to business conditions, wages paid at competitive points, or the manufacturer's ability to pay it. The ordinary labor union assumes that it has power by resolution passed in its lodges to repeal the economic laws of supply and demand. The proprietor informs the labor union that it is impossible for him to grant the wages. As a result of his refusal the mechanics in this department leave his employment and go out on strike.

The proprietor proceeds to do the natural thing—that is, he hires other workmen to take the places of the men on strike.

Persecution and Violence.

Now let us stop here to consider the relation of the parties to this controversy. Here is the same manufacturer that we agreed was carrying on a lawful business, that he could hire and discharge workmen as he saw fit without regard to their membership in a labor union, and that he had the right to carry on his business free from molestation. Here also the same mechanics that we agreed were pursuing lawful occupations, and that they

had the right to work for the manufacturer, free from molestation, or to leave his employment, as they saw fit. They elected to leave. Other workmen are now working in their places and are pursuing the same lawful occupations as the strikers pursued when they were at work. The strikers and their sympathizers assemble in close proximity to the factory as pickets. They seek to induce the mechanics at work to leave their employment; they stop every man approaching the factory that they think is going there to apply for work. They endeavor to persuade them not to apply for work and if these mechanics do not turn back immediately they threaten them directly or by insinuation with bodily harm. They follow all mechanics at work in these departments to their homes, and if the opportunity to assault them without arrest presents itself then they assault them. Their wives and children are annoyed and every insult and indignity that can be heaped upon them is heaped upon these mechanics. They may have families depending upon them in need of the necessities of life and work is absolutely essential to provide them. These nonunion mechanics may have good or poor reasons for not being members of a labor union. Whatever they are, they are sufficient to them, and if their eternal salvation depended upon their being union mechanics they could not legally be coerced into becoming such in order to obtain the privilege to work.

Some time ago I received from a man an anonymous letter which stated that he was a member of a labor union then on strike against the members of the New York Metal Trades Association, that at a meeting of his lodge a member proposed that $10 be voted to hiring some one to do up a certain nonunion mechanic in the employment of a member of the association, but that he did not know his name. The letter described the mechanic and the place where he worked sufficiently for me to identify him, and stated that while the money was not voted, yet the writer was afraid that violence would be used against this mechanic to the injury of the cause of labor, and for that reason he warned me. We protected this mechanic all we could, but a few days afterward he, with three other mechanics from the same shop, was attacked by seven men in the city of New York, and some were so seriously injured that they had to be sent to the hospital for treatment. An account of the assault appeared in all the papers of the city of New York, and it must have been known to many members of the lodge referred to, yet absolutely nothing was done to ascertain whether or not the assault was committed by a member of the lodge, and if so, to have the member expelled.

Now these acts of violence do occur, and I could cite specific instances of at least 50 during the past summer against workmen in the employment of the members of the New York Metal Trades Association. It is useless for organized labor to say that they do not occur. While labor unions as organizations may not sanction them, yet they are done with knowledge of many members and with the implied approval of the organizations. I have yet to learn of a labor union or any of its members causing the arrest and punishment of a union mechanic committing violence.

If this manufacturer is unfortunate enough to have a shop in a town where labor unions and their sympathizers predominate, then he will have additional trouble. More than likely it will be necessary for him to have mechanics come from out of town to work, and unless he provides them with food and lodging on his premises it will be impossible for them to live.

The association had occasion to send to a town within the immediate vicinity of New York a number of mechanics to take the places of men out on strike. These mechanics put up at one of the local hotels. On the same evening of their arrival the strikers routed them out of this hotel. They then sought shelter in another hotel. From this hotel the strikers drove them to a village in another State. The strikers followed them to this village and entertained them in the same manner as they had in the preceding town. As a result these mechanics were obliged to go to New York, arriving there after midnight, and to sleep in one of the parks of the city.

The labor unions insist that manufacturers do business with them, and they must, like business men and business organizations, establish by their conduct a reputation that will inspire confidence in manufacturers to induce them to do business with them. They cannot participate in all the benefits of their position and repudiate the corresponding obligations imposed upon them. It is not sufficient for labor unions to say that they are opposed to violence. Action alone brings conviction and establishes good faith under these circumstances.

Let us go back to our original strike, and we will assume that our manufacturer has been able to start his shop in operation. The next event in the programme of the closed shop is for the other trades to send a committee to the manufacturer, which informs him that he has nonunion men at work, and that under their constitution their fellow members cannot work with nonunion mechanics. If he continues the nonunion mechanics in his employment the other trades go out on strike, and instead of one strike on his hands, the manufacturer has now perhaps five.

Sympathetic Strikes.

I hear some one say that the manufacturer in his contract with these other trades unions should insist upon a provision against sympathetic strikes. This seems a very simple solution of the difficulty, and in ordinary business transactions it would be, but let us see if it is here. During a strike that prevailed in the shops of the New York Metal Trades Association, involving no principle of trade union other than the establishment of a high minimum wage and which was confined to one trade, the strike was taken up by the Central Federated Union of the city of New York. This organization appointed a committee to wait upon the New York Metal Trades Association for the purpose of adjusting the difficulty. This committee met a committee of the association in conference, which resulted in the labor union involved insisting upon its demands, and that committee threatened the association with a sympathetic strike. Upon investigation it was found that two trade unions, perhaps the most important in the employment of the members of the association, had contracts with the association which provided, among other things, that no sympathetic strikes should be called. These contracts were executed long before the strike was anticipated, but the Central Federated Union insisted that these two trade unions go out in a sympathetic strike in violation of their agreement. Greatly to the credit of these two trade unions, and a splendid tribute to their intergrity, they refused to go out on strike. For this reason they have been expelled from the Central Federated Union of the City of New York and from the New York State Federation of Labor.

The sympathetic strike was prevented not by the organized labor of the city of New York, but by two individual labor unions. Manufacturers may not always be fortunate enough to have contracts with labor unions of the same character.

The Unfair List.

The next step in this warfare, for it has become such at this time, is to place the lathes of our manufacturer on the unfair list. He is now in receipt from his customers of letters, and undoubtedly telegrams, telling him that the labor unions in different parts of the country will not permit them to use his lathes. And here new complications arise that bewilder the imagination in any attempt to follow them through their ramifications to the loss, annoyance and inconvenience caused to strangers.

This is the condition, then, that our manufacturer finds himself in. If he has the necessary means and the perseverance to oppose the demands he may succeed. This the ordinary manufacturer cannot do, and he pursues one of two courses, grants the demands and his factory is closed by his creditors, or he continues to fight on, and in like manner his factory is closed by his creditors.

And then follow obsequies over his downfall at a meeting of the Federation of Labor of the City of New York.

These are a few of the conditions that the members of the New York Metal Trades Association have to meet, and I believe that they represent, in a general way, the

conditions that almost every manufacturer is obliged to meet where labor is strongly organized. Do you wonder then that manufacturers are opposed to the closed shop under the present conditions of organized labor?

In this discussion I have stated the case of the employer as best I could and as fairly as I could from personal observations and experiences. I would regret more than I could express if what I have said should be construed in placing myself in opposition to the principles of organized labor. In my dealings with labor organizations I have had occasion to deal with their business agents. I have found many of them honest and upright, and there are business agents in this audience with whom I come in almost daily contact, and I consider it a privilege to count them as friends.

I believe in labor organizations. They are the logical outcome of our present society, they have accomplished magnificent victories for the betterment and happiness of mankind. If I were a mechanic to-day I would be a union man. I am opposed to the blots on the escutcheon of organized labor. I appeal to such powerful minds as our distinguished chairman, to the Mitchells, the Whites and the Moffits, grand examples of stanch American citizens, to wipe out these blots of violence and shifting regard for obligations. I appeal to all organized labor to make the union card a passport of integrity of purpose and accomplished high ideals, an ornament to the splendid heritage of American citizenship.

The Susquehanna Iron & Steel Company in Court.

The hearing in the matter of a receiver for the Susquehanna Iron & Steel Company of Columbia, Pa., petitioned for by the former general manager, John Q. Denney, took place at Lancaster October 24, Mr. Denney claiming negligence and incompetence. The court has taken the papers in the case and has reserved decision. The plaintiff's first offer in court was the report of Secretary and Treasurer Richard Y. Filbert for the year ending October 10, 1903. The total amount receivable on that date was $169,173.94; the amount of material and merchandise on hand, $292,825.71. The accounts payable on that date were $54,854.29, and the bills payable amounted to $131,993.15. There was $3418.80 in cash on hand. In the accounts of the pipe mill and machine shop the total amount of bills and accounts receivable was $329,155.92, and bills and accounts payable were $335,320.55.

Robert A. Houston, a director, testified to a loan from the Franklin National Bank of $100,000, and that iron on hand worth $119,000 was put up as collateral. The company have loans outstanding from the Ridge Avenue Bank to the amount of $90,000.

John Q. Denney, the petitioner, then took the stand and testified that the value of the iron put up as collateral had decreased $7 per ton since the loan was made. The company, he said, during the six months prior to July 1, 1903, had suffered a loss of $88,942.36, instead of $74,351.75 as reported by the company. In relation to the pipe mill at Columbia, witness testified that the board appropriated $215,000 for its erection. The amount was raised by a mortgage of $300,000, it being intended to use the $85,000 difference as working capital. Witness said that $40,000 additional would be required to complete the mill, and that $150,000 would be necessary to operate it.

James H. Mattheson of Middletown, an expert, said the pipe mill was poorly constructed, changes to the amount of $10,000 being necessary, and a working capital would be needed of $200,000.

Mr. Denney testified that the value of stock has declined from $5 to 75 cents per share. He had been asked to resign as general manager of the company, and the salary of that office cut from $10,000 to $5,400.

Witnesses testified that the works of the company are in a bad state of repair, the Vesta and Aurora blast furnaces being out of blast and out of working order.

Bookkeeper W. C. Martin testified that the assets of the company on October 10, 1903, were $1,932,827.50, the debts amounting to $522,167.99, leaving a balance of $1,410,659.51. The quick assets were $516,888.85. Both he and General Manager John W. Steacy testified to losses by business depression in stock and material on hand.

Armor Contracts Awarded.

Midvale Steel Company Will Make Six Thousand Tons.

WASHINGTON, D. C., October 27, 1903.—The Secretary of the Navy on October 26 awarded contracts for the armor for the five battle ships, "Vermont," "Kansas," "Minnesota," "Idaho" and "Mississippi," amounting to about $7,000,000, and Admiral O'Neil, chief of the Bureau of Ordnance, to-day made a brief statement embodying the reasons which induced the Secretary to distribute the awards among the three competitors.

The bids for this armor were opened on October 1, and since then the Secretary has given great attention to the subject, having had interviews with representatives of the respective bidders and consultations with the experts in the Department. Every phase of the question has been carefully considered and discussed, and an inspection has been made by the Chief of the Bureau of Ordnance of the works of the Midvale Steel Company, who were the lowest bidders. After a careful consideration of all the bids received for about 16,000 tons of armor plate and appurtenances for the five battle ships, the Department decided to distribute the awards among the only three bidders—namely, the Carnegie Steel Company of Pittsburgh, Pa.; the Bethlehem Steel Companyy of South Bethlehem, Pa. (both of which bid the same price), and the Midvale Steel Company of Philadelphia, Pa., awarding to the two former companies contracts for the armor for three 16,000-ton battle ships, the "Vermont," "Kansas" and "Minnesota," aggregating 10,629 tons, this amount being equally divided between the two companies, and awarding to the Midvale Steel Company a contract for the armor for the two 13,000-ton battle ships "Idaho" and "Mississippi," aggregating 6180 tons.

In making this decision the Department took cognizance of the fact that while the Carnegie and Bethlehem companies were experienced manufacturers, they have yet to deliver, in the aggregate, some 29,000 tons of armor on outstanding contracts, before they can commence to deliver on new ones, and that while the Midvale Steel Company were new bidders, they were the lowest bidders by a considerable sum, and that while they had not a complete armor plant, they had many of the most essential features of one, and the improvements now in progress and others projected gave assurance that the company would, within the time allowed, supply the quantity of armor awarded to them. Each of the bidders bid on the entire lot of 16,000 tons, and in making the awards the Department has sought to do justice to the respective bidders, having in view the best interests of the Government and the statute which provides "that no contract for the purchase of gun steel or armor for the navy shall hereafter be made until the subject matter of the same shall have been submitted to public competition by the Department by advertisement."

All armor heretofore contracted for, amounting to about 83,000 tons, has been purchased from the Carnegie Steel Company and the Bethlehem Steel Company, and these two concerns are understood to control the so-called Krupp process for hardening plates in so far as that process is either patented or a definite trade secret. The experts of the Midvale Steel Company have satisfied the Secretary, however, that they have made a sufficient study of the subject of face hardening armor plate to be able to produce satisfactory results, and the company have given a bond, conditioned not only upon making deliveries on time, but upon producing plates meeting the physical and ballistic tests prescribed by the Department. W. L. C.

At Warren, Ohio, on Monday, October 26, was begun the taking of evidence in the hearing of the claim of the Girard Iron Company against the Continental Iron Company of Wheatland, Pa., which is for $114,000. W. J. McKeefrey, trustee for the creditors, takes exception to the claim on the ground that it is not a legal one.

MANUFACTURING.

Iron and Steel.

The report that the Shenango works of the American Tin Plate Company, at New Castle, Pa., which shut down about a week ago to make repairs would not start up again until January, is untrue. The question of starting this plant will depend altogether on the orders received while the repairs are being made. If sufficient orders come in to warrant resumption the plant will be started, otherwise it will remain idle.

The report that the plant of the Wilkes Rolling Mill Company, at Sharon, Pa., had started up in all departments is untrue. The plant of this concern is idle while a large engine is being installed, and when this work is finished the plant will be started. The Wilkes Rolling Mill Company are manufacturers of muck bar, bar iron, iron and steel sheets.

The Dover Forge & Iron Company will soon complete their works at Canal Dover, Ohio, for making iron tin plate bars. There is considerable demand for roofing tin having an iron body, to be used in places where climatic influences or noxious vapors are severe. It is not profitable for small plants to operate two-high stands of bar rolls to make only small quantities, but the company believe they can on modern mills produce upon a larger scale at remunerative prices low enough to warrant the use of this material in tin mills. They will not build any tin plate or sheet mills, but will make tin bars only. The manufacturing department will be under the management of Ambrose Beard, who has had special training in this branch of the iron business.

There will be no retrenchment at the new mills of the Eastern Steel Company, at Pottsville, Pa. The working force is larger than ever, and the new mills are being rushed to completion.

The plants of the Carnegie Steel Company, at South Sharon, Pa., which have been idle for some little time, will not be started in operation until market conditions warrant.

The blast furnace of the Carnegie Steel Company, at Zanesville, Ohio, has been blown out and will probably not be started up again. The stack was formerly operated by the National Steel Company and is 75 x 16 feet in size, and was built in 1870 and rebuilt in 1883. It has an annual capacity of 65,000 gross tons.

The American Tin Plate Company will remove their Falcon works from Niles, Ohio, to Sharon, Pa. This is in line with their policy to centralize manufacturing operations as much as possible. It is probable that within a year or two at least 50 per cent. or more of the product of the American Tin Plate Company will be made in the Sharon and New Castle districts.

No. 2 stack at Ohio works of the Carnegie Steel Company, Youngstown, Ohio, will be ready for blast some time this week, but as to when this stack will be blown in has not been definitely decided. Nos. 1 and 3 stacks at this plant resumed operations Saturday, October 24, and the steel works and rolling mill, which were shut down about a week ago, were started up last Sunday night.

The hot mill department of the Laughlin works of the American Tin Plate Company, at Martin's Ferry, Ohio, has been shut down to allow some necessary repairs to be made. The tinning department will continue in operation, as enough black plate is on hand to run this part of the works for some time.

The new plant of the Kidd Brothers & Burgher Steel Wire Company, at Aliquippa, Pa., is being built as rapidly as possible, and the company expect to start early in December. The main building is 60 x 240 feet. All the machinery for the new plant is on the way and will be installed as fast as it arrives. The capacity of the new plant will be about double that of the old works at McKee's Rocks, which were destroyed by fire some months ago. The company are manufacturers of polished drill rods, polished needle wire and black steel rods.

The plant of the Shelby Steel Tube Company, at Greenville, Pa., is being greatly improved, and machinery for making tubes by a new process is being installed. The plant will shortly be started up again.

While in Lorain, Ohio, recently the officials of the United States Steel Corporation inspected the plants of the Lorain Steel Company in that city. The improvements at these works, including new blast furnaces, extension to ore docks, new skelp mills and new pipe mills, will be completed as originally contemplated and as rapidly as possible. When the improvements are all completed and put in operation they should increase the number of employees at the Lorain works between 4000 and 5000 men.

The Howard Axle Works of the Carnegie Steel Company, at West Homestead, have been shut down for an indefinite period. Lack of orders is given as the cause, and during the shut down extensive repairs will be made to the plant.

The Cambridge works of the American Sheet Steel Company, at Cambridge, Ohio, have been closed down.

The Rankin works of the American Steel & Wire Company, at Rankin Station, Pa., started up in full on Monday, October 26. Two weeks ago the rod mill, galvanizing and wire drawing mills were shut down for repairs, during which time some new machinery was installed in this plant.

It is officially denied by the Republic Iron & Steel Company that they intend to lease any of their plants in New Castle and Sharon to F. H. Buhl and P. L. Kimberley, as reported.

Rebecca Furnace of Kittanning Iron & Steel Mfg. Company, at Kittanning, Pa., has shut down. The muck bar mill at Kittanning is also idle.

Five of the ten tin mills of the American Tin Plate Company, at South Sharon, Pa., which were closed down about two weeks ago started up on Monday, October 26, making 15 mills in operation at this plant. It is expected the other five mills will be started this week.

General Machinery.

The East St. Louis Locomotive & Machine Shop Company, East St. Louis, Ill., have purchased a machine shop which will be used exclusively for repairing locomotives. The property on which the shop is located covers an area of 4½ acres, and the shop is 100 feet wide and 200 feet long. Six locomotives can be repaired at one time. Among the installations of machinery made are two lathes and two drill presses, manufactured by the Niles Tool Works, a planer made by the American Tool Works, an air compressor made by Ingersoll-Sergeant, an 80-inch wheel lathe for turning down driving wheel tires, and Chicago pneumatic tools.

The Moline Plow Company, Moline, Ill., are planning to supply one entire department of their plant with individual motors as an experiment, to determine whether the individual directly connected motor is more satisfactory than the electrically driven short jack shaft.

The A. H. Nellson Machine Company, Bridgeport, Conn., have purchased land at the West End, with the purpose of erecting a new shop. The lot is 161 x 330 feet, and is considered one of the most desirable in the manufacturing neighborhoods of the city. It is not the intention to build immediately. The company manufacture special machinery.

The new shop of the Hurwood Mfg. Company, at Bridgeport, Conn., will soon be ready for occupancy, when the business will be removed from Plainville.

The Galena Iron Works, Galena, Ill., are now moving into their new works. The plant comprises a foundry building, 60 x 100 feet; machine shop, 60 x 100 feet; blacksmith shop, 30 x 100 feet, and boiler shop, 60 x 100 feet.

The Sharples Separator Company, at West Chester, Pa., are preparing to make the largest shipment of separators in their history—30 carloads—to all parts of the world. Eight months ago a train of 23 carloads was shipped. The company's business is now greater and more prosperous than ever.

The Allentown Rolling Mill Company, Allentown, Pa., have just shipped a large consignment of pumps to the Durango, Mexico, gold mines. Others have been shipped to Idaho, Australia and South Dakota.

The Owens Bottle Machine Company, Toledo, Ohio, have placed contracts for the erection of a concrete fire proof building, 60 x 120 feet, where they will manufacture a new bottle blowing machine. The Kent Machine Company, an affiliated concern, who manufacture machinery for making bottle blowing machines, will erect an addition, 50 x 120 feet. A. Bently & Son of Toledo have the contract for both buildings.

The Cleveland Pneumatic Tool Company, Cleveland, Ohio, are now established in their new plant on Second avenue, near the Pennsylvania Railroad. They have a fine two-story brick building, 42 x 126 feet, with offices and power house adjoining. They have space for another building the same size, and they can also increase the hight of the buildings. All their machinery is new and is electrically driven. At present they are buying power, but they expect shortly to install a boiler, engine and generator to produce their own power. The Cleveland line of pneumatic tools includes 12 varieties of chippers and 18 varieties of riveters. They are enjoying a steadily increasing trade in this country, besides working up quite an extensive foreign business, much of which has come through their foreign agents, Pressluft Gesellschaft, M. B. H., Dusseldorf, Germany, and John Trumbull of Glasgow, Scotland.

The Van Buren, Heck & Marvin Company, Findlay, Ohio, manufacturers of ditch making machines and other implements, have decided to enlarge their plant at Findlay, and have purchased 5 acres of land on the Lake Erie & Western and Toledo & Ohio Central railroads. They will erect a machine shop, 150 x 250 feet, and a foundry building, 60 x 80 feet, besides an office building, storehouse, &c. Spurs will be built from both railroads.

The Yost Electrical Mfg. Company, Toledo, Ohio, manufacturers of electrical specialties, erected a large factory addition last May, but they find that their business has increased so greatly that it is now necessary to erect another addition. The new building will give them more than double their former floor space.

The Hyde Park Foundry & Machine Company, Hyde Park, Pa., manufacturers of rolling mill, steel works and tin plate machinery, have increased their capital stock to $60,000. No immediate improvements to the plant are contemplated.

The brick shop to be built by the Western Electric Company in connection with the new plant at Twenty-second street and the Belt Line Railway, Chicago, will be 361 x 549 feet, and will cost about $240,000.

The Royersford Foundry & Machine Company, Royersford, Pa., makers of the Royersford punch and shears, are working full time in all departments. They report an increasing demand for this tool, and sales have largely increased during the year. The Royersford punch and shear is built combined or single, end motor or belt drive, and is specially adapted, they say, for railroad shops, structural plants, wagon and carriage works, agricultural implement works, car and machine shops. They have established the following agencies for the sale of their line: Manning, Maxwell & Moore, New York, Boston and Pittsburgh; Marshall & Huschart Machinery Company, having sole agency for Ohio, Indiana, Illinois, Wisconsin, Michigan; J. D. Mallory, Baltimore, Md.; Frank Toomey, Philadelphia; J. W. Cregar Agency, Philadelphia; the Fairbanks Company, Buffalo and Pittsburgh; the Cameron & Barkley Company, Charleston, S. C. T. V. Parker, with headquarters at Birmingham, Ala., is looking after their interests in Alabama and other Southern States.

The pipe shop of the Vilter Mfg. Company, Milwaukee, Wis., is being improved by making it 20 feet wider and 200 feet long, together with an addition on the end, 80 x 85 feet, with steel girders 60 feet span, 28 feet high up to the roof. In this will be placed a 12-inch pipe cutting machine and a 2-inch pipe cutting machine, in addition to the 2 and 6 inch machines which will be transferred from the old shop to the new part. Overhead tracking will also be installed. Furnaces and blowers will be added for bending pipes. Electric power will be used throughout. Other improvements being made include a shipping and storeroom, 60 x 92 feet, two stories high, and a blacksmith shop, 20 x 80 feet, in which will be installed a cut off saw, punch and shear.

The Hildreth Motor & Pump Company, Lansing, Mich., will increase their capital stock from $20,000 to $30,000. The company have enjoyed a very prosperous season and report that the outlook for future business is bright. The addition which is being erected to their foundry is well advanced.

The Buffalo Forge Company have received through their Boston office the contract for heating the Boston & Albany Railroad shops, at Springfield, Mass., a large and important installation. They have also received contract for heating and ventilating apparatus for the machine shop and roundhouse of the Buffalo, Rochester & Pittsburgh Railroad, at Salamanca and Bradford Junctions. Another large mechanical draft outfit of the forced draft type recently ordered is for the Eastern Steel Company, Pottsville, Pa. They also report that orders for induced draft apparatus have been very plentiful during the past few weeks, including outfits for the Springfield Light, Heat & Power Company, at Springfield, Ill., and the Champion Copper Company, Painsdale, Mich., both to be used in connection with the Green Fuel Economizer Company's apparatus. Another installation of importance is for the American Smelting & Refining Company, Omaha, Neb. In addition to these orders and many others not mentioned above, the company have in hand a number of foreign orders of importance, a notable installation—or induced draft apparatus—being for the Vatreme Company, New Rushkeno, Moscow, Russia, the order being received through their London branch.

The Empire Folding Machine Company, Palmyra, N. Y., recently organized, have taken over the business of the Peerless Folding Machine Company, and will manufacture a full line of newspaper, booklet and circular folding machines. They have rented the shops, and are now moving into them, formerly occupied by Jones, Gordon Press Works, branch of the Chandler & Price Company, Cleveland, Ohio. No new tools are required. The officers are: Will E. Forsyth, president and treasurer; Chas. A. Sessions, vice-president; Chas. S. Ziegler, secretary; Judge S. Nelson Sawyer, counsel; Chas. E. Bennett, superintendent.

Robert Holmes & Bros., Danville, Ill., machinists, engineers and boiler makers, have purchased a plot of ground at Tilton, where they will erect a new plant, to consist of a brick and steel building, possibly two, 60 x 200 feet, with several smaller buildings. The new location is on the Wabash and Big Four railroads and will afford much better shipping facilities and more room for manufacture, both of which they have been badly in need of for some time. When the new buildings are completed most of the equipment will be moved to Tilton, where the main part of the business will be done, but the shop at Danville will also be kept running to take care of the repair work in that section. No new equipment will be required.

The report that the Fischer Foundry & Machine Company, Pittsburgh, operating a plant on the Pittsburgh & Lake Erie Railroad, below McKees Rocks, had purchased a plant belonging to C. C. Wais of Cincinnati is untrue. The Fischer Foundry & Machine Company have, however, purchased from Mr. Wais a lot of patterns, drawings and patents applying to punch and shear machinery.

The Mesta Machine Company, at West Homestead, have laid off a number of men. They, however, are quite busy, having contracts on hand for a large number of engines.

There is no truth in the report that the American Locomotive Company are to move their plant from Manchester, N. H., and consolidate it with their works at Schenectady, N. Y.

Baker, Stillwell & Hart, Birmingham, Ala., manufacturers' agents, represent with other houses the Link Belt Machine Company, Chicago, Ill.; Lidgerwood Mfg. Company, New York; National Steam Pump Company, Sandusky, Ohio; S. Lombard Iron & Supply Company, Augusta, Ga.; Latter Martin Pump Company, Hickory, N C., and the Tweeddale Patent Water Softening Company, New Orleans, La. They carry a full line of building supplies of all kinds and have just erected a building at 1722 North Tenth avenue for the manufacture of mineral paints and ochres.

The American Air Tool Company, who, as noted in these columns last week, are to occupy the works of the defunct Hartford Axle Company, at Dunkirk, N. Y., have incorporated with a capital stock of $300,000. They will manufacture pneumatic tools.

Henry C. Bradley, manufacturer of wood working and other machinery, Bridgeport, Conn., is building a new factory at the West End. The building will be of brick, 36 x 76 feet, and two stories A part of the machinery has not been purchased.

The Moore Drop Forging Company, Springfield, Mass., have completed their new plant at Brightwood, which they expect to occupy about November 1. It consists of a drop forging shop, 50 x 74 feet, to which is joined a press room, 20 x 40 feet, and a machine shop, 45 x 64 feet. The company recently increased their capital stock from $30,000 to $40,000. A. L. Moore has been elected president and manager and A. H. Chapin treasurer.

The F. W. Spacke Machine Company have been incorporated at Indianapolis with $20,000 capital; directors, Fred. W., John, William, George and Edward Spacke.

Power Plant Equipment.

The Department of the Interior, Washington, D. C., will receive bids until November 19 for the construction of complete water and sewer systems at Grand Junction School, Colorado.

The Armstrong Mfg. Company, Bridgeport, Conn., have installed a 36 horse-power Fairfield Motor Company gasoline engine for power purposes.

A contract has been received by the Electrical Installation Company, Chicago, for the building of an electric railway for the Trinidad Electric Railway Company, Trinidad, Col. The contract also calls for the installation of an electric lighting plant in addition to the railway power plant. The work is now progressing on the buildings as well as on the grading, track laying and overhead work.

The borough of West Middlesex, Pa., have awarded the contract for the construction of a water works plant to William McIntire & Sons of Sharon. The plant will cost about $16,000.

The new plant of James H. Paine & Son, engine builders, at Noank, Conn., will give the firm increased manufacturing facilities. The shop will be 50 feet long by 62 feet wide, one story, with monitor roof and galleries under the wings. The purpose in making the width in excess of the length is that when the shop is enlarged it will be in the right proportion. The center bay will have 25 feet span, 25 feet clear to the beams, and will be equipped with a traveling crane. The larger tools will be installed in this bay, and here also the setting up will be done. The side bays and their galleries will be used for small tools and pattern shop. At the shore end of the shop will be a large door that teams may drive in under the crane for loading and unloading. At the opposite end of the building will be a door opening upon the wharf. A derrick will be used for removing or placing machinery on steamers. To facilitate this work tracks and car will be used. The firm manufacture engines, pumps and other machine equipment of steamers.

Crawford & McCrimmon Company, Brazil, Ind., intend to build a two-story brick building, 40 x 150 feet, which will be used for offices and drafting rooms. The company also contemplate the erection of a foundry next year. Among recent orders are the following: Enterprise Coal Company, Bicknell, Ind., one pair 15 x 30 hoisting engines; Virginia Iron, Coal & Coke Company, Bristol, Va., one 20-foot fan; Erie Coal & Coke Company, Meyersdale, Pa., one 12-foot fan; Meadow Brook Coal & Coke Company, Fairmount, W. Va., one 12-foot fan; West End Coal Company, Scranton, Pa., one 8-foot fan; Standard Supply & Equipment Company, Scranton, Pa., two 15-foot fans; Union Coal Company, Hymera, Ind., one pair 20 x 36 hoisting engines; Egyptian Coal & Coke Company, Harrisburg, Ill., two pairs 18 x 32 hoisting engines; Quemahoning Coal Company, Somerset, Pa., one 20-foot fan.

Sealed proposals are being received at Fargo, N. D., for one 150 horse-power internal furnace boiler of the Morrison corrugated type, with a working pressure of 150 pounds. Address H. J. Gibson, city auditor.

The Westinghouse Electric & Mfg. Company of Pittsburgh have secured a contract to install a 300-kw. electric generator and motor and blower equipment at the works of the Wolverine

Portland Cement Company of Coldwater, Mich. The equipment will be put in the works at Quincy, Mich., and will drive a coal pulverizing plant for its rotary kilns.

Application has been made for a receiver for the Rumsey-Williams Company, St. Johnsville, N. Y., manufacturers of gasoline engines. The assets are stated to be $20,000 and liabilities $38,000.

Buffalo dispatches state that bids are asked until November 12 for reconstruction and repair of electric plant, installing engines, generators, switchboard and branch steam and exhaust piping at New York State Soldiers and Sailors' Home. G. L. Heins, State Architect, Albany, N. Y.; G. W. Dunn, president Board of Trustees, Bath, N. Y.

The Skinner Engine Company, Erie, Pa., have let the contract for an addition to their plant, 50 x 175 feet. The building will be of brick and steel and will be equipped with a traveling crane extending its entire length. The improvements will cost about $15,000.

Work on the large additions being made to the plants of the Westinghouse Electric & Mfg. Company, at East Pittsburgh, Pa., is progressing rapidly, and it is expected the new building will be completed and equipped before the first of the year. The building will be 200 x 1360 feet in dimensions, two stories in hight, and will be of brick. It will contain the most modern machinery to be procured for the construction of electric motors, dynamos and other electrical machinery. The addition to the plant will add about 3500 more workmen to the forces of the company at East Pittsburgh, making about 12,000 employees in all. A portion of the old force will be used to man the new department, and the vacancies caused by the depletion of the old shops will be supplied from the many applicants from all over the world.

Foundries.

The Acton Valley Forge & Casting Company, 52 Broadway, New York, have incorporated with a capital stock of $25.000, to produce castings, forgings and special iron work. A. Hardoncourt, Jr., has been elected president and general manager.

Young, Eberhard & Martin of Cleveland, Ohio, have submitted a proposition to the village of Norwalk, Ohio, looking to the establishment of a plant in that place for the manufacture of malleable iron castings. They offer to erect a plant to employ 700 men for 40 acres of land and $100,000 in cash. They propose to erect two large buildings, one 70 x 320 feet and one 110 x 200 feet, together with a power house and other smaller buildings. Owing to newspaper reports, the impression has gained ground that the Eberhard Mfg. Company of Cleveland are back of the project, but officials of the Cleveland company state that they are in no way interested in the enterprise.

The South Bend Foundry Company, South Bend, Ind., are building an addition to their foundry, 80 x 130 feet, and have installed a new engine, boiler and cupola. The building has steel truss roof.

The Spieler & Winter Mfg. Company, Syracuse, N. Y., recently incorporated, have secured part of the buildings formerly occupied by the Phœnix Foundry, and have installed a plant for the manufacture of die cast castings of special bronze, which are finished ready to assemble without any machine labor whatsoever. The company will pay special attention to the casting of parts that are difficult to machine or costly to produce in quantities. It is stated that the bronze compares favorably with mild machine steel in its physical tests, and can be soldered, plated and forged cold or hot. The machine tool equipment was furnished by the Prentiss Tool & Supply Company and Garvin Machine Company, New York, and the Syracuse Supply Company, Syracuse, N. Y. George Winter is president, Harry G. Winter vice-president and August J. Spieler secretary and treasurer.

Referee in Bankruptcy William H. Hotchkiss has ordered that a meeting of the creditors of the New York Car Wheel Works of Buffalo be held November 5 to consider a sale of the company's property, as proposed by the receiver, the sale to take place at that time if a majority of the creditors in number and amount agree. Mr. Hotchkiss indicated that the plant must bring at least $100,000, or he would not approve the sale.

The National Steel Castings Company, Cleveland, Ohio, have been incorporated under laws of Delaware, with $160,000 capital stock, by H. Lindale Smith, W. B. Newcomb and J. R. McQuiggie of Cleveland. The company have acquired the shops and appurtenances of the defunct American Foundry & Machine Company, Ravenna, Ohio, and they propose to conduct a general foundry business and manufacture bolts and other materials for construction purposes. The Ravenna plant was erected about two years ago for the manufacture of mining machinery, under the patents of C. H. Lane. A few months ago it was leased to George H. Bowler & Co., Cleveland, but this firm recently went into receivers' hands. The new company will have Cleveland offices in the Williamson Building.

The Philadelphia Foundry & Machine Company, Philadelphia, Pa., are still busy on loam work and have taken additional orders for locomotive cylinder castings from both the Baldwin and Rogers locomotive works, and have room for others. A number of general castings, both loam and green sand work, have recently been shipped to their various customers.

The Nazareth Foundry & Machine Company, Nazareth, Pa., have recently completed another addition to their plant. A three-story brick building, 28 x 78 feet, has been erected, adjoining their present machine shop, and is being used for offices and for pattern and machine work. They have been very busy on a large amount of general cement machinery, as well as specialties for cement manufacture, including a number of Wentz patent cement clinker coolers, some of which have been shipped to Michigan and to Ontario, Canada. Among some of the large orders on hand is one from the Little Rock Railway & Electric Company, Little Rock, Ark., for a large quantity of cast iron pipe and fittings, varying from 4 to 26 inches in diameter.

Upon the completion of the immense new foundry now being built by the Pennsylvania Railroad Company at Altoona, Pa., the foundry work now being done in the locomotive constructing shops at that place will be concentrated in the new building. The room now occupied by these departments will be devoted to construction work, and the Pennsylvania Company will then be in position to build engines. Orders have been issued to suspend work on a number of engines to have been built at Altoona, in accordance with the general curtailment of expenses. These will be built next year.

The Sharon Foundry Company have completed the largest casting yet made at their plant, at Wheatland, Pa. It weighs 11½ tons and is a pan for the Carnegie furnace No. 1, at South Sharon. Uriah Bingham, who has recently been appointed foreman of the Sharon foundry, is an experienced foundryman, having for some years been connected with another Sharon foundry plant.

The Monongahela Foundry & Forge Company, Monongahela, Pa., manufacturers of machine molded castings, advise us that they have secured a contract for machine molded castings which amounts to $140,000 a year and runs for five years.

The Rochester Car Wheel Company, Rochester, N. Y., have obtained three judgments against the Ramapo Car Wheel Company of Hillburn.

The Providence, R. I., Steel Casting Company, details of whose organization and description of whose proposed plant were printed in *The Iron Age* several months ago, are about to begin building their foundry at Providence. They will use the Tropenas process of steel making. The Fort Pitt Bridge Company, Pittsburgh, have the contract for the buildings.

The Ludlow Valve Mfg. Company, Troy, N. Y., have about completed the erection of their new foundry. The equipment has been secured.

Bridges and Buildings.

The George West Steel Bridge Company have been organized at Parkersburg, W. Va., with a capital of $100,000, to build and construct bridges of iron, steel and wood. The incorporators are J. N. Camden, S. W. Goff, J. H. Fischer, C. C. Martin, W. W. Jackson, E. L. Davidson, W. W. Walker, Parkersburg.

The Illinois Central Railway are having plans prepared for the construction of a bridge over the Tennessee River at Gilbertsville, Ky. The structure will be 1700 feet long, with steel superstructure. Work is in charge of H. W. Parkhurst, engineer of bridges and buildings, Chicago.

The Trussed Concrete Steel Company, Detroit, Mich., have been incorporated, to erect re-enforced concrete work in accordance with the Kahn system of re-enforcement. Julius Kahn is president and manager and Ralph M. Dyar secretary.

Fires.

The plant of the Champion Drill Company, Avon, N. Y., was burned on the 23rd inst., involving a loss estimated at $15,000 to $20,000, with no insurance. It has not been decided as to whether the plant will be rebuilt. The company had just completed and shipped a large order of Champion grain drills for the foreign trade and shut down for taking inventory two days before the fire.

Fire at the plant of the Nott Fire Engine Company, Minneapolis, Minn., recently caused a loss of $6000, fully covered by insurance. Several finished fire engines were damaged, but the loss will in no way interfere with the delivery of orders.

The boiler works and manufacturing plant of J. K. Petty & Co., Lebanon, Pa., were completely destroyed by fire on the 18th inst. Many valuable patterns, machinery and considerable finished product were destroyed. The loss is roughly estimated at $30,000.

The Napanee Paper Mills, Napanee, Ont., were recently destroyed by fire, entailing a loss of about $15,000.

The Iron Bedstead Company's works, at Ossining, N. Y., were destroyed by fire October 26. The loss is placed at $10,000.

The machine shop of Harry Smith, at Webster, Md., was recently destroyed by fire. The loss is about $5000.

Daniel Brothers' machine shop, at Tuscaloosa, Ala., was destroyed by fire last week.

The White River Pulp Mill, near Ashland, Wis., was burned October 22. The loss is estimated at $50,000.

On October 27 fire damaged the plant of the Curry Woodenware Company, Cincinnati, Ohio, to the extent of $80,000.

Hardware.

The Piqua Handle & Mfg. Company, Piqua, Ohio, are increasing the output of their Ole Olsen lawn rake for the coming season, and have recently added a line of chisel, carving tool and file handles, embracing some new features and improvements. The company have been exceedingly busy in the production of their entire line.

The Wetmore Glue Tank Company are now located in their new quarters, at 27 South Huron street, Toledo, Ohio, where they occupy a commodious three-story structure, 30 x 125 feet., especially fitted up for the production of the Wetmore patent glue cooker and other glue room appliances, under the supervision of J. A. Taggart, general manager.

The Fawkes Mfg. Company, Minneapolis, Minn., were incorporated October 1 with $25,000 capital stock, $10,000 of which was paid in cash. This company will manufacture the Fawkes double acting washing machine, as well as cream separators, ice cream freezers, sad irons and other specialties.

The Champion Tool & Hardware Company, Evart, Mich., makers of lumbering tools, have built a branch plant at Cairo, Ill., in order to give more prompt service and lower freight rates to their patrons in the Southwest.

The Red Cross Mfg. Company, Bluffton, Ind., manufacturers of wind mills, tanks, pumps, &c., are making extensions to their foundry to secure increased capacity. The company are also building a large fire proof pattern vault.

The Waterloo Wagon & Buggy Company, Waterloo, Iowa, have purchased a site and expect to erect a modern factory, doubling their present capacity.

The H. F. Brammer Mfg. Company, Davenport, Iowa, have just finished building an addition, 80 x 200 feet, in which they are installing three boilers, two of them being already in place. The company have also purchased a 200 H.-P. Bates-Corliss engine, which has just arrived and is being put in position. Machinery from the old buildings will be removed to the new quarters in about ten days. The old plant will be utilized for finishing washing machines, and with the operation of the improvements will practically double capacity.

The Hercules Buggy Company, Evansville, Ind., will build a $12,000 brick addition to their plant, 80 x 130 feet, and three stories high.

Victor Petertyl, Traverse City, Michigan, is having a new carriage factory erected, which, when completed and equipped with machinery, will cost about $15,000. The building will be of brick construction, two stories in hight, 80 x 140 feet. Installations will be made of a 60 horse-power boiler and a 40 horse-power engine.

At a recent meeting of the stockholders of the Dain Mfg. Company, Ottumwa, Iowa, the following officers were elected for the ensuing year: President, Joseph Dain, Jr.; vice-president, J. T. Hackworth; secretary, Paul Arbenz; auditor, Calvin Manning. The company have just closed a very successful year.

The Imperial Furniture Company of Grand Rapids, Mich., an especially well equipped furniture factory in the way of machinery, have placed a contract through Rice & Co., Limited, Grand Rapids, Mich., for the equipment of their new plant with modern glue room appliances, such as glue cookers, glue pots, glue pot heaters and glue setters, manufactured by Wetmore Glue Tank Company, Toledo, Ohio.

The business of the Kile Mfg. Company of Mansfield, Ohio, and Salem Kile & Son of Akron, both of whom are engaged in the manufacture of sucker rods and handles of various kinds, has been consolidated under the name of the former, and the Mansfield plant will be removed to Akron. Officers of the new company are: Salem Kile, president; W. L. Kile, secretary; G. H. Kile, treasurer. A large brick addition will be erected at the Akron factory, and considerable new machinery will be installed. An engine and boiler house will be added.

The American Mfg. Company, manufacturers of cordage, 63-65 Wall street, New York, report that their different mills are working to their fullest capacity. In one of their specialties, transmission rope, the orders are so many in number and large in quantity that their present facilities for producing American transmission rope are entirely unequal to the demand. The company have accordingly placed orders for additional machinery, which will double their output.

The Parish & Bingham Company, Cleveland, Ohio, manufacturers of sheet metal stampings, have increased their capital stock from $100,000 to $250,000, and have absorbed the plant and business of the American Tubular Wheel Company of Pittsburgh. The company will manufacture an all steel wheel, following closely the pattern of the wood artillery wheel now commonly used on large automobiles. The wheels will be built for heavy trucks as well as for automobiles. The wheel exemplifies a new use for the process of welding metal by electricity, as each spoke has no less than five electric welds in its make up. The two sections forming the butt of the spoke are stamped from sheet and welded edgewise. The center portion of each spindle is 16 gauge electrically welded tube, which is welded to the butt. To this is welded a short section of tube of considerably heavier gauge, which is then threaded to receive the screw which draws the spoke into the rim. Around each spoke head is placed a copper washer to take up the vibration and prevent crystallization of spoke or screw. The wheels are made in several weights, and any type of bearing or rim is furnished.

Miscellaneous.

The General Fire Proofing Company of Youngstown, Ohio, are having a very large demand for their herringbone expanded steel lath, which is made from Nos. 26 and 28 gauge steel sheets. They are also manufacturers of steel furniture, for which they are having a very heavy trade.

The Star Automobile Company, Cleveland, Ohio, which was formed a year ago to manufacture gasoline automobiles, has decided to withdraw from the business, and the machinery will be disposed of and the plant used for other purposes. Several of the gentlemen interested in the company are identified with the firm of Van Dorn & Dutton of Cleveland, and much of the machinery will be utilized by them.

The brass goods manufacturing business of C. W. Van Blarcom & Co., 14 Church street, New York, has been incorporated as the C. W. Van Blarcom Company, with a capital stock of $100,000. The present plant of the company is taxed to its capacity, and it is not unlikely that the early spring will see plans in preparation for enlarging the facilities. The directors are J. Wallfield, E. W. Van Blarcom and Herbert Van Blarcom.

The Racine Boat Mfg. Company, Racine, Wis., are building a $50,000 steel yacht for John W. Gates. The yacht is of the turbine propeller type, 100 feet long, 17 feet beam, with a loaded draft of 30 inches. The machinery consists of twin screws driven by two 200 horse-power triple expansion engines, supplied with steam from a Racine water tube boiler at 250 pounds pressure. The hull is constructed throughout of steel, the deck houses and interior finish being of solid mahogany. There are five staterooms, each fitted with Pullman berth, brass bed, wash basins, dresser, &c. The boat is intended for cruising on the Mississippi River and the Gulf of Mexico, and will have a speed of 17 miles per hour.

The plant of the Electrical Lead Reducing Company, Niagara Falls, N. Y., was last week shut down for a period of six weeks, while improvements are being made and new machinery installed by which the capacity of the plant will be doubled.

Nelson Morris & Co. are building a packing plant at Kansas City, Mo., consisting of 16 buildings approximating eight stories in height and 1,800,000 square feet of floor space. Installations of machinery will be made for 1200 tons refrigerating capacity, cluding 4500 horse-power boilers and 1600 kw. electric machinery. The buildings will be of fire proof construction and will be equipped throughout with the latest and most modern machinery.

The Craig Shipbuilding Company, Cleveland, Ohio, have closed a contract with the Graham & Morton Company of Chicago for a steel sidewheel passenger steamer to ply on Lake Michigan between Chicago and St. Joseph, Mich. The vessel will be 265 feet over all, 65 feet wide over guards, and 16 feet molded depth. A distinctive feature will be that all the machinery and the boilers will be practically in a steel well, rising from the keel to the top of the ship, in order to guard against fire. The engines will be of the three-cylinder compound inclined type, with cylinders 36, 52 and 53 inches in diameter by 72-inch stroke of piston. Steam will be furnished by four Scotch boilers 13 x 12 feet, carrying 150 pounds pressure and developing 3500 horse-power. In general, the boat will be fitted with the latest appliances and she will have a guaranteed speed of 20 miles an hour.

Eli Atwood and H. T. Atkins have purchased two-thirds of the stock of the Lebanon, Pa., Chain Works, controlled by the Standard Chain Company of Pittsburgh. The Lebanon Chain Works rank among the best equipped in the country and have large Government contracts for harbor cable.

The Wilson Enameling & Plumbers' Supply Company, Allentown, Pa., have purchased 6 acres of land on which to erect a plant. The plant will cost $35,000 and the machinery $59,000.

The Moline Scale Company, Moline, Ill., have purchased 7 acres of land in East Moline, adjoining the Union Malleable Iron Company's plant. The company will occupy buildings on this property which were originally built for the Weir Plow Company. This plan was adopted for enlargement of capacity instead of rebuilding on their present location, which was too small.

The Kearns Furniture Company, High Point, N. C., will rebuild their shops, which were recently destroyed by fire. The machinery has been secured.

T. W. L. Casaday Mfg. Company, South Bend, Ind., recently incorporated, are occupying a two-story brick building which is completely equipped for both wood and machine work. At present they are using steam power, but it is possible that they will change to electricity in the near future. The company manufacture the Casaday rotary engine and water tube flue cleaner, Casaday bow facing oars and the Cleaveland novelty mud guard for bicycles. W. L. Casaday, president of the South Bend Chilled Plow Company, is president; G. A. Cleaveland, vice-president and secretary, and J. Oliver Casaday, treasurer.

The works of the Pressed Steel Car Company at McKee's Rocks, Pittsburgh, which have been idle for some little time, have resumed operations in nearly all departments. It is said this company have recently secured some good sized orders for steel cars.

PERSONAL.

J. J. Dunn of Shelby, Ohio, has been appointed superintendent of the plant of the Shelby Steel Tube Company, at Greenville, Pa.

A. H. McIlvaine, for some time head draftsman at the plant of the Vulcan Foundry & Machine Company, New Castle, Pa., has been secured in the same capacity by the Standard Engineering Company, at Ellwood City.

Edwin S. Woods, formerly vice-president and manager of the Kindl Car Truck Company, has resigned that position, and will engage in business for himself. His specialty will be the Woods roller side bearing. He will be located at 1121 Monadnock Block, Chicago.

Robert E. Jennings has retired from the Crucible Steel Company of America. He has resigned as second vice-president and as a member of the Executive Committee. We understand that it has been his desire to do so for a long time, but he could not see his way clear to do so until now. Mr. Jennings will not at present engage in any active business, but will give some time to a number of interests with which he is connected.

David C. Reid, president of the Harlan & Hollingsworth Company, Wilmington, Del., has also taken the management of the Crescent Shipyard at Elizabeth, N. J., where he will reorganize the force and bring about the completion of vessels now under way.

W. D. Zehnder, president of the Scranton Bolt & Nut Company, Scranton, Pa., has been elected a director of the Passaic Steel Company, Paterson, N. J.

T. J. Heller, formerly New York agent for the Federal Mfg. Company for their Steel Ball Department, has left that company, and has taken the sales management of the ball business of the Standard Roller Bearing Company, who have recently purchased the ball business of the Grant Tool Company. Mr. Heller will make his headquarters care of the Standard Roller Bearing Company, Forty-eighth street and Girard avenue, Philadelphia.

Charles S. Roberts, formerly secretary of the American Steel & Wire Company, has been elected to the presidency of the Weaver Coal & Coke Company, Chicago, succeeding Henry C. Weaver, who has been appointed vice-president.

At a meeting of the Board of Directors of the Youngstown Iron Sheet & Tube Company, Youngstown, Ohio, held last week, George E. Day was elected secretary. Mr. Day is also general sales agent.

The arrival is expected at an early date of Dr. Hans Goldschmidt of Essen, Germany, the well-known inventor of the process of "thermite" welding with a mixture of aluminum and oxide of iron. He was a leader, too, in the manufacture of pure chromium and manganese. Dr. Goldschmidt is a partner in the chemical firm of Theodor Goldschmidt, established in 1847, who, among other lines of industry, operate a very large detinning plant.

M. C. Shannon, formerly assistant chemist for the Tennessee Coal & Iron Company, has been appointed chief chemist for the Alabama Wire & Steel Company, with headquarters at Gadsden, Ala.

George W. Colles has resigned his position as chief engineer with Marion & Marion of Montreal, Canada, and has opened an office as consulting mechanical and electrical engineer in Milwaukee, Wis. Mr. Colles is a member of the American Society of Mechanical Engineers.

Millard Hunsiker, the representative of the United States Steel Corporation in Europe, sails for his post this week.

H. C. Frick of Pittsburgh, Pa., has tendered to the United States as a gift a painting by Theobald Chartran of the scene when the peace protocol was signed at the White House at the close of the Spanish War.

Rear Admiral Francis T. Bowles, chief constructor of the navy, has resigned to accept the presidency of the Fore River Shipyard at Quincy, Mass.

George Greer, general manager of the Shenango and New Castle works of the American Tin Plate Company, at New Castle, Pa., denies that he is to resign his position and locate in California.

Joseph Wharton Thurston, who was formerly identified with the Bethlehem Iron Company, is now associated with E. B. Leaf & Co., iron and steel merchants, of Philadelphia, whose offices are in the Real Estate Trust Building.

M. A. Neeland of the William Tod Company, Youngstown, Ohio, has returned from a two months' trip to Europe. While abroad Mr. Neeland investigated the gas blowing engine question, and it is probable that as a result of his reports the William Tod Company will engage in the manufacture of gas blowing engines.

Why Staybolts Break.

At the recent meeting in Chicago of the Master Steam Boiler Makers' Association John Livingston of Montreal, Canada, read a paper on the breaking of staybolts which contained some very practical observations. Following are his remarks in part:

Your chairman produced a board showing 171 heads of staybolts from the right side of the fire box on the fire side sheet of a locomotive; at least 75 out of the 171 were burned. You have held that the breakage of staybolts is due to expansion and contraction, and, being unable to counteract the expansion and contraction with the solid staybolt, the discussion centered on flexible staybolts. Too little heed was paid to the lesson taught on the board; too little consideration was given to the *prima facie* fact that the heads of 44 per cent. of those staybolts were burned.

The Mexican Central Railway Company state that they have had 30,000 flexible staybolts on trial for four years. They tell you they cost much more than the rigid bolts, that they are unsatisfactory, that they have just as many broken staybolts in the flexible, that they find it difficult to detect the broken staybolts, and that they are renewing with solid bolts as fast as they come to the shops for new boxes, and that for 90 engines on order they have specified rigid staybolts. That is an answer founded on the test of service which cannot be combated.

To avert the risk of burning from the inner end of the bolt outward there is only one way, and that is with air through the center of the bolt and the water around it. You cannot unduly expand a bolt of that character.

Given two locomotives stayed with good equal quality and equal sized staybolts, the locomotives put into service in the same locality under the same conditions and equally well cared for, the locomotive with the staybolt having the hole through its center will endure in service 20 per cent. longer, will steam better and burn less fuel. All solid staybolts are subject to the risks aforesaid. Those more or less crystallized are the cause of the greatest number of breakages in staybolts.

The Pittsburgh Steel Company.—The Pittsburgh Steel Company of Pittsburgh, operating rod and wire mills at Monessen, Pa., have recently installed a number of fence making machines in Hamilton, Ontario, Canada, and expect to have these in operation by November 15. The plan is to ship the wire from Monessen to Hamilton, owing to the fact that Canada has a tariff on fencing but not on wire, and the wire shipped to Hamilton will be made into electrically welded steel fencing. The Pittsburgh Steel Company have a very large trade in Canada in their fencing, and for this reason have decided to install machinery at Hamilton to turn it out in large quantities. A contract has been placed with the Cataract Power Company of Hamilton for the electrical power to be used in the operation of the new works.

The Fairfield Motor Company, Bridgeport, Conn., are getting out a new 10 horse-power two-cycle gasoline engine designed for use in auto launches. The two cylinders will be in one casting, and will have a large diameter as compared to stroke, the diameter being 5 inches to a 4½-inch stroke The engine will run at 700 revolutions. The base will be aluminum, which will take off 75 pounds of weight, bringing the total down to 325 pounds. The engine will be 17 inches high above the shaft center and 16 inches long fore and aft.

The Iron and Metal Trades.

It is exceedingly puzzling, with the spectacle of works closing and starting again, to reach any conclusion as to the real volume of consumption. Buyers keep very close to shore, and manufacturers decline to stock product when its cost promises to be lower with the opening of next year. Under such conditions consumption is probably larger than appears on the surface, but what is really troubling makers most is the uncertainty of the future. During the winter months in normal years the consumption is lighter than at other times of the year, and it is too much to hope that this will prove an exception. With the tonnage on the books wasting away it is difficult to hold prices, in spite of "gentlemen's agreements" or pools.

The Central Western producers of Pig Iron are taking the restriction of output very seriously. The East may get down to business at the coming meeting on Monday. The South is rapidly getting down to restriction through the natural course of shrinking selling prices.

While many in the trade have great faith in the efficiency of the remedy proposed, others hold that the drastic measures reveal the existence of an unexpectedly serious evil.

Birmingham has got down squarely to $10 for No. 2 Foundry, but the most interesting development of the week has been the report that a lot of 10,000 tons has been sold for shipment to Manchester, England. If that transaction has been put through, it means that a serious cut below our own domestic level of values has been accepted. The through freight from Birmingham to Manchester, including insurance, is close to $3.25 per ton, which does not net much above $8 per ton for No. 3, at Birmingham, against $9.50 as the ruling price for domestic markets. The best chance for Southern Iron abroad lies in the Mediterranean markets, which our makers can reach to better advantage, so far as the freight situation is concerned.

The Steel trade is dull, and in the territory east of the Alleghanies is affected by the offerings in a restricted market of Open Hearth Billets by works usually consuming their own Steel product, but now having a surplus. From the Central West comes the report of a large sale of high carbon Billets at a material concession from pool prices.

The markets for Finished Iron and Steel are, generally speaking, dull, and the new tonnage coming up fails to replace that which is being shipped on old orders. There is a good deal of talk of export business, but thus far comparatively little tonnage has been secured. There have been some moderate Steel Rail orders for neutral or distant markets, like Australia and Asia, and there are feelers for a very large amount for Russia. Something has been doing in Steel Plates in a moderate way on the basis of about 1.30c. at mill for export orders.

The extraordinary events in the Copper industry in Butte, Mont., may have a very serious effect upon the Metal trade. There is every reason for believing that the shut down on the part of the Amalgamated Company was decided upon after very mature consideration, and the conviction is expressed that the idleness will continue for months. Since the production of the mines is at the rate of 20,000,000 to 22,000,000 lbs. per month, the matter is serious. It may show itself in an actual advance of Electrolytic Copper above the price of Lake, since the former is preferred by many Copper Wire makers.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct.28, 1903.	Oct.21. 1903.	Sept.30, 1903.	Oct.29, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$15.25*	$14.75	$15.75	$22.50
Foundry Pig No. 2, Southern, Cincinnati	*12.75*	13.00	14.50	22.25
Foundry Pig No. 2, Local, Chicago	*15.50*	15.50	15.75	23.00
Bessemer Pig, Pittsburgh	*15.85*	15.85	16.35	21.75
Gray Forge, Pittsburgh	*14.00*	14.00	14.50	21.75
Lake Superior Charcoal, Chicago	*17.50*	17.50	19.00	26.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	27.00	27.00	27.00	29.50
Steel Billets, Philadelphia	*27.00*	26.50	27.50	27.50
Steel Billets, Chicago	*27.00*	28.00	28.00	29.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*12.50*	13.50	14.00	19.00
O. Steel Rails, Philadelphia	*13.50*	13.75	15.00	21.50
O. Iron Rails, Chicago	17.00	17.00	17.00	25.00
O. Iron Rails, Philadelphia	*17.00*	17.50	18.00	24.50
O. Car Wheels, Chicago	18.00	18.00	18.00	24.00
O. Car Wheels, Philadelphia	*16.00*	16.50	16.50	19.00
Heavy Steel Scrap, Pittsburgh	*14.50*	15.00	16.00	....
Heavy Steel Scrap, Chicago	*12.00*	13.00	13.00	18.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.50	1.50	1.50	1.92
Common Iron Bars, Chicago	*1.45*	1.40	1.50	1.80
Common Iron Bars, Pittsburgh	*1.45*	1.45	1.50	1.80
Steel Bars, Tidewater	1.70	1.70	1.73½	1.75
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater	1.78	1.78	1.78	2.10
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.90
Beams, Tidewater	1.73½	1.73½	1.73½	2.00
Beams, Pittsburgh	1.60	1.60	1.60	2.10
Angles, Tidewater	1.73½	1.73½	1.73½	2.00
Angles, Pittsburgh	1.60	1.60	1.60	2.00
Skelp, Grooved Iron, Pittsburgh	*1.45*	1.50	1.55	1.95
Skelp, Sheared Iron, Pittsburgh	*1.60*	1.60	1.65	2.05
Sheets, No. 27, Pittsburgh	*2.50*	2.50	2.55	2.65
Barb Wire, f.o.b. Pittsburgh	2.60	2.60	2.60	2.45
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	2.00	1.85
Cut Nails, f.o.b. Pittsburgh	2.15	2.15	2.15	2.05
METALS:				
Copper, New York	**14.00**	13.12½	13.50	11.75
Spelter, St. Louis	*5.55*	5.45	5.65	5.20
Lead, New York	4.40	4.40	4.40	4.10
Lead, St. Louis	*4.27½*	4.25	4.40	4.00
Tin, New York	*25.75*	25.70	25.90	26.75
Antimony, Hallett, New York	6.25	6.25	6.25	7.75
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.99	3.99	3.99	4.19

Chicago.

FISHER BUILDING, October 28, 1903.—(*By Telegraph.*)

No Iron or Steel product shows strength as compared with last week's report, and some lines, notably Old Materials and Southern Pig Iron, have had serious sinking spells. A fair hand to mouth business from both mill and store indicates that buyers are still operating their plants, if not to their full capacity, at least reasonably near it. Buyers in general are crouching for the spring like foot racers, and the moment the pistol shot of lowest prices sounds in the air there will be a rush to cover. Foundry yards, Iron stores and the supply rooms of large users are practically empty. Meanwhile mills are piling up surplus stocks. When the time comes to move the vast tonnage from the surplus at the mill to the deficit at the consuming end there will be lively times for railroad tracing clerks. Dealers in Old Materials complain that their customers arbitrarily reject shipments that are fully up to specifications on alleged inspection, because of the falling market, whereas a year ago everything went that looked like Scrap. In Bar Iron the one producer who is disposed to cut the price to 1.40c. is a little less free to make open quotations at that price, reserving the privilege of rejecting orders that are not for large tonnage or that do not carry high extras. The demand for Structurals is opening up, possibly owing to less insistence on the part of labor unions to enforce untenable demands. The report of good crops and the optimistic position taken by Western railroads are having a healthy effect, and the feeling in general in the trade is that while the bottom may not yet be reached in some lines, there is a better day coming, not far off.

Pig Iron.—The downward tendency noted last week is still manifest, and furnace representatives here state that they are reasonably sure that orders have been placed on

the basis of $10, Birmingham, for No. 2 Foundry. No firm will acknowledge, however, that such a price was made by them, each pointing the finger at a competitor as being the guilty party. One furnace representative states that he has taken business and is looking for more on the basis of $10, Birmingham, for No. 2 that is a little off grade. A large Southern producer states that before this issue reaches its readers he will have sold a surplus stock of 2000 or 3000 tons at $10, or a shade less if necessary, to move it at once, but that when that lot is sold his price will be $10.25. A prominent Illinois melter is sending out inquiries for 2000 tons of No. 2 Southern, shipments to begin at once. While the furnaces seem willing to move surplus stocks on a basis of $10 for No. 2, they do not care to make contracts beyond January 1 on that basis, unless equal quantities are taken in November and December. It is predicted that the next move on the checker board will be a reduction in freight rate from Birmingham to Chicago to $3.65, or, in other words, a 20c. cut on the through rate from Ohio River points to this city. If such cut is made, it will be met by a retaliatory cut on the roads carrying Iron from Valley furnaces, making the Valley rate to Chicago $2.10 instead of $2.30. Northern furnaces have about reached the limit of their ability to meet Southern competition, and if prices continue to decline it is more than likely that a number of Northern furnaces will blow out. At the same time it is freely predicted that at least 25 per cent. of the Southern furnaces will be forced to go out of blast should an open base price of $10, Birmingham, be reached on No. 2. This lessening of production North and South will tend to strengthen prices. The sanguine ones are predicting that $12 or above will be the Birmingham base price before the end of the winter. No large transactions can be noted, and many of the largest melters now state that even $10, Birmingham, has no attraction for them, as they expect Iron to go much lower. Current quotations range about as follows:

Lake Superior Charcoal	$17.50 to $18.50
Northern Coke Foundry, No. 1	16.00 to 16.50
Northern Coke Foundry, No. 2	15.50 to 16.00
Northern Coke Foundry, No. 3	14.50 to 15.00
Northern Scotch, No. 1	16.00 to 16.50
Ohio Strong Softeners, No. 1	17.30 to 17.80
Ohio Strong Softeners, No. 2	16.80 to 17.30
Southern Silvery, according to Silicon	16.35 to 16.85
Southern Coke, No. 1	14.60 to 15.10
Southern Coke, No. 2	14.10 to 14.60
Southern Coke, No. 3	13.85 to 14.10
Southern Coke, No. 4	13.35 to 13.85
Southern Coke, No. 1 Soft	14.60 to 15.10
Southern Coke, No. 2 Soft	14.10 to 14.60
Foundry Forge	13.35 to 13.85
Southern Gray Forge	13.10 to 13.60
Southern Mottled	13.10 to 13.65
Southern Charcoal Softeners, according to Silicon	17.85 to 18.85
Alabama and Georgia Car Wheel	21.85 to 22.85
Malleable Bessemer	16.25 to 16.75
Standard Bessemer	17.00 to 17.50
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon	18.80 to 20.80

Bars.—Steel Bars remain at 1.76½c., base, half extras, but buyers are only specifying their immediate needs for purposes where Iron Bars cannot be used. Small independent producers are shading this price 50c. to $1 per ton, according to their freight distance from Chicago. Large users of Steel Bars anticipate a general cut on or about January 1, and will not contract for large tonnages until then. In Bar Iron the situation remains practically unchanged since our last issue, one producer only in this market naming a price of 1.40c., base, half extras, on desirable specifications. Rival interests assert that this producer is not actually quoting this price to the trade, and the producer himself now states that he would use his judgment about accepting orders at this price, depending upon the character of the order. The bulk of the Bar Iron business being placed in this market is at prices ranging from 1.42½c. for large tonnages to 1.50c. for single car lots, with occasional single car lots selling at 1.45c. where sizes carry large extras. We quote car lots or greater from mill, f.o.b. Chicago: Steel Bars, 1.76½c., base, half extras; Iron Bars, 1.40c. to 1.50c., base, half extras; Angles, less than 3 x 3 inches, 1.86½c., base; Hoops, in 250-ton lots and greater, 2.06½c.; smaller lots, 2.16½c., full extras. Leading jobbers are still naming the price of 2c., full extras, on Bar Iron, and 2c., half extras, on Bar Steel; Angles, less than 3 x 2 inches, 2.10c., half extras. But jobbers not bound by agreement are selling Bar Iron as low as 1.80c., full extras, where competition from outside points makes a cut necessary.

Structural Material.—There seems to be a slow awakening in the demand for Structural Material. Nowadays an inquiry for a 1000-ton lot is a sensation in this market, while a year ago it would not have created a ripple. A large office building on State street will use about 1500 tons, unless owners become alarmed and delay its construction. One of the implement concerns will build a warehouse that will use possibly 500 tons. A building on Wabash avenue that may or may not be erected this winter calls for a little less than 1000 tons, while similar constructions in Chicago and the West are in the market with inquiries for buildings ranging from 100 to 500 tons. Prices remain unchanged as follows for mill shipment, Chicago: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. Local stocks are being gradually reduced and the market is steady, but the demand is only moderate. The following are the agreed prices: Beams and Channels, 2.10c. to 2.25c.; Angles, 2.10c. to 2.25c.; Tees, 2.15c. to 2.30c., from local yards. These prices include cutting to lengths of 5 feet and over without extra charge. Lengths less than 5 feet are charged standard extras for medium, and large quantities and double standard extras for wagon load buyers.

Plates.—The Plate business moves in the even tenor of its way, the business being a distinctly hand to mouth proposition. We quote official prices for shipment from mill as follows: Tank Steel, ¼ inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c.; Universal Mill Plates, 1.75c. to 2c. We quote from store as follows: Steel, ¼ inch and heavier, 2c. to 2.15c.; Tank Steel, 3-16 inch, 2.10c. to 2.25c.; No. 8, 2.15c. to 2.30c.; No. 10, 2.30c. to 2.40c.; Flange Steel, 225c. to 2.40c., all f.o.b. warehouse, Chicago.

Sheets.—This commodity lacks the stability of the Plate market, owing to competition of a number of small independent mills that are seeking for tonnage at whatever concession in price may be necessary to secure it. The disposition to cut prices is more evident on the lighter gauges than on the heavier. In the prices which follow the minimum prices stated are for large shipments and the maximum for the occasional car lot buyer: No. 10, 1.96½c. to 2.06½c.; No. 12, 2.06½c. to 2.16½c.; No. 14, 2.16½c. to 2.26½c.; No. 16, 2.26½c. to 2.36½c.; Nos. 18 and 20, 2.41½c. to 2.51½c.; Nos. 22 and 24, 2.51½c. to 2.61½c.; No. 26, 2.61½c. to 2.71½c.; No. 27, 2.71½c. to 2.81½c.; No. 28, 2.81½c. to 2.91½c. From store we quote: No. 10, 2.30c. to 2.40c.; No. 12, 2.40c. to 2.50c.; No. 14, 2.50c. to 2.60c.; No. 16, 2.60c. to 2.70c.; Nos. 18 to 20, 2.75c. to 2.85c.; Nos. 22 and 24, 2.85c. to 2.95c.; No. 26, 2.95c. to 3.05c.; No. 27, 3.05c. to 3.15c.; No. 28, 3.15c. to 3.25c. Galvanized Sheets are offering at 75, 10 and 5, Pittsburgh, with 5c. freight allowance, on desirable sepcifications and 75, 10 and 2½ on mixed specifications. From store Galvanized sells at 75 and 2½ to 75 and 5 discount.

Cast Iron Pipe.—No large orders are noted, though the pick up business is fairly active for this time of year. Small orders for quick delivery are coming in satisfactorily at the following prices, f.o.b. cars, Chicago: 4-inch, $29.50; 6-inch and larger, $28.50, in carload lots, for Water, and $1 per ton higher for Gas Pipe. These prices, however, are being shaded in quoting on large contracts.

Billets.—That the forging shops are all reasonably busy is indicated by the steady demand for Forging Billets. No large orders, however, have been placed within a week and none seem to be on the way. Carload prices, Chicago, for shipment from mill are from $27 to $28 for Rerolling Bessemer, $28 to $29 for Open Hearth Rerolling Billets, and $31 to $32 for Open Hearth Forging Billets, the higher prices named being those paid by occasional car lot buyers, and the lower prices those quoted on 50 to 100 ton lots.

Merchant Pipe.—Demand continues active for Pipe and Fittings, and Western mills have no difficulty in making almost immediate shipments from their ample stocks. Inasmuch as Pipe prices are held firmer and the Pipe mills are able to secure Skelp at prices lower and lower, the Pipe maker is at last making a little money. Discounts remain the same as before, prices being for car lots, random lengths, mill shipment, Chicago delivery, as follows:

	Steel Pipe,		Guaranteed Wrought Iron	
	Black. Per cent.	Galvd. Per cent.	Black. Per cent.	Galvd. Per cent.
⅛ to ⅜ inch	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches	67.35	57.35	64.35	54.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—Orders for Boiler Tubes would indicate that Western Boiler shops are doing about 75 per cent. of their last year's business. Prices are unchanged, although the leading producer does not quote as low prices as do the largest jobbers. Discounts quoted by this producer are:

	Steel.	Iron.
1 to 1½ inches	40.85	37.35
1¾ to 2½ inches	53.85	36.35
2¾ to 5 inches	59.35	46.35
6 inches and larger	53.85	36.35

The jobbers agree in quoting for shipment from mill in car lots, f.o.b. Chicago:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches	43.35	40.85	53.35
1¾ to 2½ inches	55.85	38.35	40.35
2¾ to 5 inches	60.85	48.35	Up to 4 in. 48.35
6 inches and larger	55.85	38.85	....

From store in car lots or less we quote as follows, to correct the erroneous quotations of last week:

	Steel.	Iron.
1 to 1½ inches	40	35
1¾ to 2½ inches	50	32½
2¾ to 5 inches	57½	42½
6 inches and larger	50	..

Merchant Steel.—The character of orders coming in makes it clear that the agricultural implement manufacturers and other users of Merchant Steel are buying from hand to mouth. Prices remain unchanged, as quoted below, though in some of the lines named a disposition is shown on the part of the manufacturers to make concessions where large contracts are in the balance. The following are the official prices, f.o.b. cars, Chicago: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.50c. to 2.55c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 5c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

Rails and Track Supplies.—Two thousand tons of Rerolled Rails were sold last Saturday to a committee of buyers who spent a week in Chicago hammering down the market. The price at which the tonnage was placed is not divulged, although it is generally understood that it is lower than all previous quotations. Taken in the aggregate, there are pending inquiries for about 10,000 tons of either New or Rerolled Rails of medium and light sections for small steam and electric roads. The largest of these propositions is a 1200-ton inquiry of 60 to 70 lb. Rails from an Illinois electric railroad. The Atchison, Topeka & Santa Fé has bought 12,000 tons from the Lackawanna Steel Company. The Missouri, Kansas & Texas Railroad has also bought 8000 tons from the same mill for delivery during the winter and spring. The purchase price is withheld. Prices, f.o.b. Chicago, range as follows for shipment from mill in car lots: Standard Rails, $28 to $30; Standard, second quality, $27 to $29; Light Rails, 25 to 12 lbs., $32 to $35; Angle Bars, 1.90c. to 2c.; Spikes, 2s. to 2.10c.; Track Bolts, 3½ x 3¾ inches, 2.75c. to 2.85c., with 15c. advance for Hexagon Nuts.

Metals.—The spectacular closing of the Amalgamated mines has boosted Copper at least 1c. per lb. in this market, possibly more. Local interests do not seem to know exactly what the price will be, but estimate that Casting Copper in 50-ton lots will sell for 13½c., and in smaller lots for 13¾c., with Lake Copper ¼c. higher. Lead is somewhat stronger, 4⅜c. being quoted in 50-ton lots, 4.40c. in carload lots and 4⅝c. in less than carload lots. Spelter is also a little stronger in tone, selling at 5.65c. to 5.75c. in carload lots, with smaller lots held at 6c. Old Copper and Brass, in sympathy with new material, have advanced sharply, but Lead and Zinc are unchanged. Sales of Heavy Cut Copper are made at 12⅛c., Copper Bottoms at 11⅛c., Red Brass at 11⅛c., Lead at 4c. and Zinc at 4½c., spot.

Old Material.—The tendency of the market is still downward, and there is but little, if any, prospect for improvement. The demand is very irregular and for no large amounts. Offerings, while of only moderate quantities, are ample to supply the little call which is being made for nearly all kinds. It is distinctly a buyers' market, and while the prices that follow are those nominally quoted for carloads, large quantities can doubtless be had at still lower prices, for nearly all kinds are lower. The following are the approximate quotations per gross ton, f.o.b. cars, Chicago:

Old Iron Rails	$17.00 to $17.50
Old Steel Rails, mixed lengths	12.50 to 13.00
Old Steel Rails, long lengths	15.00 to 15.50
Heavy Relaying Rails	24.00 to 25.00
Old Car Wheels	18.00 to 18.50
Heavy Melting Steel Scrap	12.00 to 13.00
Mixed Steel	11.00 to 12.00

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	17.00 to 17.50
Steel Car Axles	15.00 to 15.25
No. 1 Railroad Wrought	13.00 to 13.75
No. 2 Railroad Wrought	12.00 to 12.75
Shafting	15.00 to 15.50
No. 1 Dealers' Forge	11.50 to 12.00
No. 1 Busheling and Wrought Pipe	9.50 to 10.00
Iron Axle Turnings	10.00 to 10.50
Soft Steel Axle Turnings	10.00 to 10.25
Machine Shop Turnings	8.50 to 9.00
Cast Borings	4.50 to 5.25
Mixed Borings, &c	4.50 to 5.25
No. 1 Boilers, cut	10.00 to 11.00
Heavy Cast Scrap	12.50 to 13.00
Stove Plate and Light Cast Scrap	9.50 to 10.00
Railroad Malleable	12.00 to 12 50
Agricultural Malleable	11.00 to 12.00

Coke.—The expected strength in the Coke market has not developed in spite of car shortage. On the contrary, prices are still sagging. We quote 72-hour Connellsville, $5.40 to $5.65; Connellsville Furnace, $4.75 to $5; West Virginia 72-hour, $5 to $5.25; West Virginia Furnace, $4.65 to $4.90. Some shrewd Coal dealers along Dearborn street have bought up chance lots of 48-hour Connellsville, which they are offering as 72-hour at about 50c. less than standard prices.

The Anglo-American Export Agency of 95-97 Liberty street, New York, have changed the style of their firm to George Owen & Co., Limited.

Philadelphia.

FORREST BUILDING, October 27, 1903.

The market for Iron and Steel is probably a little broader than it has been for some time past, although it cannot be regarded as satisfactory. Nothing is being bought for delivery beyond November and December, and a good deal of that is on a compromise with buyers, who have high priced Iron to receive on old contracts. Prices, however, are fairly steady, and with the exception of Southern brands Pig Iron commands about the same as last week. But the volume of business is disappointing. The foundry trade keeps up very well, but the mill trade is distressingly dull. Some mills are doing a fair business, but the majority are only about half employed, while some for a week at a time are doing absolutely nothing. Prospects are not encouraging as regards the immediate future, although there are some who express the opinion that improvement is only a question of time, meaning by that the early spring, if not before. Against that, however, must be placed the fact that the end of the year is only a few weeks distant, and under present conditions it is hardly likely that any important work will be undertaken during the interim. Moreover, while prices are low by comparison with what they have been, they are high compared to what they were during the period from 1893 to 1898. The changes in business and in business methods, important as they are, may not prevent history repeating itself. Furnaces are not likely to remain idle indefinitely if there is a $14 to $15 market for Pig Iron, or a $1.50 to $1.75 market for rolled products. It may be for a while that the overwhelming desire to get into the swim can only be checked by lower prices, or by a still further decrease in the demand, which would amount to the same thing. Prices, therefore, are not likely to be higher at any time during the winter months. Continued inactivity will lead to lower costs, and lower costs to lower prices, and this in all probability is what must be met, although it will not be possible to get cheaper ores during the winter months; but the only thing that can prevent an ultimate decline will be an increased demand, of which there is no immediate prospect.

Pig Iron.—It is difficult to define the Pig Iron situation. A reduced output of 20 per cent. in this district and of 25 to 40 per cent. in the Central West ought to make prices very much stronger, but at the present time the tone appears to be neither better nor worse than it was a month ago, neither is there anything to indicate what the effect is likely to be a month later on. There are two ways of looking at it; the first is that only a bad condition of affairs would lead to the adoption of such drastic measures, and the second, while it may and probably will prevent any material decline from present quotations, yet it cannot develop a larger volume of business. It will no doubt make such business as there is somewhat less unprofitable, but it is by no means certain that stocks will be reduced to a point which will permit of a resumption of activity on a scale equal to that during September. All that can be fairly expected is that it will prevent the demoralization which appeared imminent a month ago, but whether the relief is to be permanent or not remains to be seen. The action of the Southern furnaces in not taking their share of the curtailment is most unfortunate, and will do much to nullify the benefits which might be expected under other circumstances. For the present, therefore, the feeling is one of considerable uncertainty, so that buyers continue as before to limit their purchases to their probable requirements during the next five or six weeks. Prices have a wide range, the extreme being about as follows for city or nearby deliveries:

No. 1 X Foundry	$16.00 to $16.50
No. 2 X Foundry	15.25 to 15.75
No. 2 Plain	14.50 to 15.00
Southern No. 2 X, rail shipment	14.50 to 14.75
Southern No. 2 X, on dock	14.00 to 14.25
Standard Gray Forge	13.75 to 14.25
Ordinary Gray Forge	13.25 to 13.50
Basic	14.50 to 15.00

Sales of 10,000 tons of Southern Pig Iron have been closed for shipment to Manchester, England; price believed to be around $10, f.o.b.

Steel.—There is more inquiry and some sales at about $27, with inquiries for lots of 1000 to 2000 tons each, but buyers expect to do about $1 per ton better, and are therefore in no haste to close the deals. Prospects indicate a little more activity during the coming month, but there is no disposition to make contracts for deliveries extending beyond the current year.

Plates.—Compared with the earlier portion of the month there has been a somewhat better demand, but there is nothing that can be designated as an active market. There are very few orders on the books that are likely to be specified for in the near future, so that new business receives prompt attention. Base prices for city and nearby deliveries, up to 100 inches: Tank Steel, both Sheared and Universal, 1.75c. to 1.80c., in large lots; Flange, 1.85c. to 1.90c.; Commercial Fire Box, 1.95c. to 2c.; Locomotive Fire Box, 2.25c. to 2.30c; small lots, 10c. to 15c. per 100 extra; 100 to 110 inches, 0.5c. extra; 110 to 115 inches, 0.10c. extra; 115 to

120 inches, 0.15c. extra; 120 to 125 inches, 0.25c. extra; 125 to 130 inches, 0.50c. extra; over 130 inches wide, 1c. extra; Plates under ¼ inch on edge, 0.10c. extra; under 3-16 inch on edge to No. 8, 0.15c. extra; No. 9, B. W. G., 0.25c. extra; all Sketch Plates, 0.1c. extra; all Circle Plates, 0.2c. extra.

Structural Material.—There is nothing in sight to change the general tone of the market from what it has been for some time past. The demand is fair, but so many mills need work to go on with that there is a chronic condition of hunger. Prospects are somewhat indefinite, but on the whole there is no probability of much change until after the turn of the year. Prices are unchanged, as follows: 1.73½c. to 1.85c. for Beams, Channels and Angles, according to specifications.

Bars.—The Bar trade is not active, although the difference in price favors Iron to some extent as against Steel Bars. Prices are slightly lower than they were a week ago, but at the decline there is a pretty strong undertone, and some mills quote 1.55c. to 1.60c. for best Refined Bars. Others accept about a tenth less on first-class orders, say 1.45c. to 1.50c., but it is not unlikely that there is a difference in quality which is equivalent to the difference in price. Steel Bars continue at 1.73½c., although some buyers say they can do better than the prices named.

Sheets.—There is little or no change from last week either in price or demand. Mills are running moderately full, but there is no orders of any account beyond what comes in from week to week, so that it is difficult to say anything in regard to the future, as it all depends on developments from day to day.

Old Material.—Prices are still on the down grade, and even at the decline there is only an irregular demand. Bids and offers for deliveries in buyers' yards are about as follows:

Old Steel Rails	$13.50 to $14.00
Heavy Steel Scrap	13.00 to 13.50
Low Phosphorus Scrap	20.00 to 21.00
Old Steel Axles	16.00 to 17.00
Old Iron Rails	17.00 to 17.50
Old Iron Axles	19.00 to 20.00
Old Car Wheels	16.00 to 17.00
Choice Scrap, R. R. No. 1 Wrought	16.00 to 16.50
Country Scrap	14.00 to 15.00
Machinery Scrap	13.00 to 14.00
No. 2 Light Scrap	11.50 to 12.00
No. 2 Light (Ordinary)	9.50 to 10.50
Wrought Turnings	10.50 to 11.00
Wrought Turnings, Choice Heavy	11.50 to 12.00
Cast Borings	7.00 to 7.50
Stove Plate	10.50 to 11.00
Wrought Iron Pipe	12.50 to 13.00

St. Louis.

CHEMICAL BUILDING, October 28, 1903.—(*By Telegraph.*)

Pig Iron.—There have been no developments of a particularly startling nature in the Pig Iron situation at this point the past week and buyers continue to be prompted by a most careful and conservative plan of buying. The call is for moderate lots to cover immediate needs, and there is still lacking the disposition to provide for requirements far in advance. Prices are variable, but we think the majority of transactions are being closed on a $10.25, Birmingham, basis for No. 2 Foundry. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$14.00 to $14.50
Southern, No. 2 Foundry	13.50 to 14.00
Southern, No. 3 Foundry	13.00 to 13.50
Southern, No. 4 Foundry	12.50 to 13.00
No. 1 Soft	14.00 to 14.50
No. 2 Soft	13.50 to 14.00
Gray Forge	12.50 to 13.00
Southern Car Wheel	25.50 to 26.00
Malleable Bessemer	17.50 to 18.00
Ohio Silvery, 8 per cent. Silicon	22.00 to 22.25
Ohio Strong Softeners, No. 1	18.00 to 18.50
Ohio Strong Softeners, No. 2	17.50 to 18.00

Bars.—A moderate order of demand exists for both Iron and Steel Bars, and local jobbers repeat the former quotation of 2c. to 2.10c. on lots from store.

Rails and Track Supplies.—The general uncertainty in other departments of the market is having its effect in this class of supplies and a mild degree of activity is the report for the past few days. The purchase of about 8000 tons of Standard Section Steel Rails by a Southwestern road from an Eastern mill is, we think, the most important recent transaction. Prices are as follows: Bars, 1.95c. to 2.05c.; Bolts, with Hexagon Nuts, 2.95c. to 3.05c.; with Square Nuts, 2.80c. to 2.90c.; Spikes, 2.05c. to 2.20c.

Angles and Channels.—Jobbing conditions in this line have been fairly active and quotations rule as before. In lots from store for this class of material 2.25c.

Pig Lead.—Activity has not been prominent in the Lead market, but steadiness has prevailed. Nominally 4.27½c. for Missouri brands and 4.30c. for Desilverized.

Spelter.—Moderate amount of demand and prices are on a slightly better basis than we last quoted. Nominally, 5.55c.

Cleveland.

CLEVELAND, OHIO, October 27, 1903.

Iron Ore.—The movement from the Lake Superior region to the lower lake ports has been so restricted during the month that the estimates now are that the October shipment will not exceed 2,250,000 tons. Last season the shipment for October was upward of 3,000,000 tons. The situation is now such as to warrant the belief that it will be impossible for the lake movement for the year to exceed 25,000,000 tons. The sharp reduction in the amount of Ore being brought down the lakes of necessity affects the lake situation. It has been noted for several weeks that the fleet of the Steel Corporation has been in the market for wild cargoes. The sharp bidding for loads by the vessel owners, of which the foregoing is ample indication, has not resulted in any open lowering of the rates of Ore carriage, the freights remaining as they have been: 80c. from Duluth, 72½c. from Marquette and 60c. from Escanaba. The Marquette rate is nominal, few if any wild shipments being made through that port. The movement of boats has been affected by the delays occasioned in the St. Clair River by a wreck, which has practically blocked navigation.

Pig Iron.—The Foundry Iron market is in a little better shape than it has been here of late. The character of the selling has changed. Buying for delivery through the remainder of the year is more general. In the past week a number of sales of 500-ton lots have been made, and a few orders running 1000 tons and upward have appeared. Inquiry has been made for delivery during the first half of next year. Furnaces and consumers are a great way apart on prices for such delivery, and the market will likely see no transactions for some time. In this immediate territory the foundries are melting less Iron than they have been doing. Some of them are laying off molders. The basis of prices is $14.50 in the Valley for No. 2 Foundry. The Valleys now have 21 furnaces shut down, and others are inclined to follow rather than accept lower prices. The reduction in Southern Iron prices has not made it necessary to lower the price of Northern Iron. The demand for the Southern product has been fairly heavy, but nothing extraordinary. In some instances the Southern furnaces cut the price of No. 2 Foundry to $10, flat, Birmingham, but those stacks which quoted such a price have receded from it and are now back on the basis of $10.75. There has been some demand for Southern Iron for next year's delivery, but the makers have refused to accept orders for delivery after January 1 on the present basis of prices. The Bessemer and Basic markets are dead. No inquiries have been received, and therefore no prices have been asked or quoted. The Coke market has been firm and steady, production being equal to the demand and the shipments from the ovens free. Good 72-hour Foundry Coke is still $3 at the oven, with High Sulphur Cokes bringing $2.75.

Finished Iron and Steel.—At the meeting of the Agricultural Implement manufacturers, held in this city last week, it was generally supposed that some action would be taken relative to production for the ensuing year. Upon this prospective action some of the Steel men were counting to establish a gauge by which the business for the coming year might be determined. It cannot be learned, however, that any such action was taken. The meeting also closed without any purchase of Bar Steel having been made. There are still many of the Agricultural Implement works using considerable Steel which have not yet covered their needs. They have been guaranteed against a decline in prices and yet withhold their orders, preferring to buy for their current needs. Steel prices have held firm regardless of the fact that these buyers and others have been demanding a reduction. Quotations are 1.60c., Pittsburgh, for Bessemer, and 1.70c., Pittsburgh, for Open Hearth. The substitution of Iron for Steel has become still more general, manufacturers being tempted by the difference of $4 per ton in the price. Bar Iron is now about steady on the basis of 1.40c. at the mill, with a few holding for 1.45c., but with no large tonnage being taken at that price. Efforts are being made to prevent a further break, but with no understanding as yet which would insure such a result. Some mills are well filled with orders. The Sheet trade is without much change, except that the association mills are finding a constantly greater portion of their trade being taken by smaller concerns making concessions in prices. The volume of business is said to be about equal to that of a year ago, but an increase has occurred in productive capacity. The cuts in prices range from $2 to $3 a ton. The indications are that a good business in Billets is being done by the smaller concerns which are cutting prices. The big demand is for Forging Billets, upon which the smaller concerns are not demanding the $3 extra which is held for by the association mills. The association price quoted is $27.50 for 4 x 4 Bessemer; $28.50, Cleveland, for Open Hearth, and $31.50 for Forging Billets. The independents are getting $26, Cleveland, for Bessemer and $27.50 for Open Hearth and Forging. There have been a few calls for Rails in 500-ton lots. Plates and Structural Material hold steady with but little being done. Shipbuilders are trying to get a reduction, hoping

to infuse some life into their lagging trade, but the mills will not respond. Some good tonnage is being withheld from the market, it is said, on this account.

Old Material.—The market is lifeless, with only light trade in busheling and Cast Scrap. Readjusted to a lower level of prices, the market is quoted as follows, all gross tons: Old Steel Rails, $17; Old Iron Rails, $20; Old Car Wheels, $18; Railroad Malleable, $14 to $14.50; Cast Borings, $6 to $6.50. All net tons: No. 1 Railroad Wrought, $14; No. 1 Busheling, $11.50 to $12.50; Wrought Turnings, $9.50 to $10.50; Iron Car Axles, $22; No. 1 Cast Scrap, $12.50 to $13; Stove Plate, $11.

Cincinnati.

FIFTH AND MAIN STS., October 28, 1903.—(*By Telegraph.*)

In the main there is no change to report in the general condition of the Pig Iron market. The hand to mouth policy still characterizes trading. Both buyers and sellers alike seem strongly averse to contracting very far into the future, and this from opposite diagnosis of the situation. A few buyers seem to be nearly convinced that the bottom is about reached, while perhaps a few furnaces are still a little shaky in their adherence to quotations and are inclined to listen to acceptable buyers at a moderate cut, rather than stand firm and possibly lose a trade. The surmise of last week as to some seller looking for business at $10, Birmingham, for No. 2 Foundry is just about an accepted fact to-day. There is a limited offering on that basis, and the assurance as well that other sellers, while not disposed to openly quote on that basis, nevertheless instruct agents to submit any good business offered at that figure for a consideration. The market may be summed up as quite dull, with no prospect of a near-by improvement. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$13.25 to $13.50
Southern Coke, No. 2	12.75 to 13.00
Southern Coke, No. 3	12.25 to 12.50
Southern Coke, No. 4	11.75 to 12.00
Southern Coke, No. 1 Soft	13.25 to 13.50
Southern Coke, No. 2 Soft	12.75 to 13.00
Southern Coke, Gray Forge	11.50 to 11.75
Southern Coke, Mottled	11.50 to 11.75
Ohio Silvery, No. 1	18.15 to 18.65
Lake Superior Coke, No. 1	16.15 to 16.65
Lake Superior Coke, No. 2	15.65 to 16.15
Lake Superior Coke, No. 3	15.15 to 15.65
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	$20.75 to $21.25
Lake Superior Car Wheel and Malleable	20.00 to 20.50

Pittsburgh.

PARK BUILDING, October 28, 1903.—(*By Telegraph.*)

Pig Iron.—Despite reports to the contrary, it is a fact that the blast furnaces in the Central West will make a united effort to further decrease production of Pig Iron, and a meeting of the Pig Iron Committee having this matter in charge will be held in this city probably next week. The original plan provided for a reduction of about 750,000 tons in October, November and December, and it is the intention now to increase this to at least 1,000,000 tons. The furnace interests seem favorable and there seems to be no doubt but that the taking off of the market of this large tonnage of Pig Iron will have a good effect. At present about 20 furnaces in the Central West are idle and others are preparing to bank. Only small lots of Pig Iron are changing hands, but there seems to be a little more inquiry. Bessemer Iron is held at about $15, Valley furnace; Northern No. 2 Foundry Iron about $14.75, Pittsburgh, but there have been some resales of Northern Foundry Iron taken in payment for Coke at lower figures. It is believed, however, that this Iron, which disturbed the local market to some extent, has all been cleaned up. We note the sale of several small lots of Southern No. 2 Foundry Iron on the basis of about $10.25, Birmingham, or $14.60, Pittsburgh. It is probable that for a good sized tonnage and a firm offer $10, Birmingham, could be done. Local Forge Iron is fairly strong at $14, Pittsburgh, and we note a sale of 150 tons at that price.

Steel.—The market continues somewhat quiet as far as new tonnage is concerned, but specifications on old contracts are said to be coming in a little better. The amount of Steel that is being sold under the Billet arrangement is very small, as many of the principal consumers of Steel are covered by sliding scale contracts, which, with the much lower prices ruling for Bessemer Iron, reduces the price of Bessemer and Open Hearth Steel furnished under these contracts very materially. There have been some sales of Open Hearth Billets at prices ranging from $26 to $28 a ton. Bessemer Billets are covered by the Billet arrangement, as there are no outside mills to furnish these, and they are held at $27, Pittsburgh.

(*By Mail.*)

The condition of the Iron trade does not show any material changes, either in the direction of better demand or prices, since our last report. The whole situation seems to depend upon the money market, and if money becomes more plentiful, which will allow the railroads to market new securities and raise funds for betterments, a material improvement in demand for Iron and Steel products of all kinds may be confidently expected. This accounts largely for the fact that railroads this year are more backward than usual in placing orders for Rails for 1904 delivery, and the amount of new tonnage booked is very much smaller than usual at this season of the year. There are reports that the price of Rails may be reduced to $26 a ton for 1904 delivery, but this is officially denied, and the statement is made that the price of Rails will remain at $28, which has been the ruling figure for several years. Statements in the daily press that very little attention has been paid to the circular letter sent out by the committee of blast furnace operators who have in hand the matter of restricting output of Pig Iron are misleading. We have been officially advised that the original scheme for a 25 per cent. reduction in Pig Iron output is being carried out, and at this writing upward of 20 blast furnaces in the Central West are idle, making quite a material restriction in output of Pig Iron. It seems advisible, however, that reduction in output should go further than at first contemplated, and, as stated in our report last week, a second letter has been sent out by the Pig Iron Committee, asking the views of the furnace operators as to a further shut down of furnaces. Replies to this second letter have been uniformly favorable and it is believed that the recommendation of the Pig Iron Committee for a further reduction of product will be adopted. It is expected that within the next three months the shut down of the furnaces will result in a restriction of output of fully 1,000,000 tons or more of Pig Iron. This should have a beneficial effect on the market, and it is confidently expected that it will. Sales of Pig Iron and Steel continue very light, but prices are fairly strong, and it is not believed that Pig Iron can go very much lower in view of the present high prices of labor, Ore and Coke. Bessemer Iron is fairly firm at $15, Valley furnace, or $15.85, Pittsburgh. Northern No. 2 Foundry Iron is $14.75 to $15, Pittsburgh, and Northern Gray Forge is $14, Pittsburgh, at which price several small lots have recently been sold. Offerings of Southern Foundry and Forge Iron in this market are more plentiful on account of the reduction in freights of 50c. a ton, and also because of the disruption of the Southern Pig Iron Association, No. 2 Foundry having been recently offered at very close to $10, Birmingham, equal to $14.35, Pittsburgh. However, very little Southern Iron has come into this district for some time. Much attention is being given to the labor side of the market, and it is the concensus of opinion that there will be a material reduction in labor of all kinds at the first of the year.

Muck Bar.—The market continues extremely dull, and several plants in this district that turn out this class of product are idle on account of lack of demand. We quote domestic grades of Muck Bar at $26.50 to $27, Pittsburgh.

Steel Rails.—The Rail situation is not very clear, and reports are current of some friction among the mills in arranging the allotments for next year. The entrance of Lackawanna as a producer of Rails and the possibility of a Rail mill being built by the Republic Iron & Steel Company at Youngstown are factors of importance at present. The fact that some tonnage has been taken by Eastern mills for Western delivery is causing some comment. It is true that the Ohio works of the Carnegie Steel Company, at Youngstown, have again started, but the plant is running largely on Billets, Sheets and Tin Bars, to be distributed to constituent interests. We quote at $28 at mill for Standard Sections.

Plates.—The situation continues extremely quiet, and the amount of new tonnage being placed in Plates is relatively small. Several of the largest Plate mills in this district are idle at present for lack of orders. The Steel car concerns report a slightly better inquiry for Cars, and a part of the McKees Rocks works of the Pressed Steel Car Company have started up. The fact that railroads find it practically impossible to float new securities means that the building of new Cars will be on a limited scale until the money market improves. There is no change in prices, and we quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Structural Steel.—A good deal of tonnage in bridge work has been placed in the past week or two, much of

which has gone to the leading interest. The Structural shops, as a rule, are fairly busy, and a great many small contracts are being placed which aggregate considerable tonnage. It will probably be the policy of the American Bridge Company to centralize operations as much as possible at Ambridge, where their new plant is located. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

Ferromanganese.—There is practically nothing doing, and we quote English and domestic Ferro at $48, delivered, in 50-ton lots and over.

Sheets.—A meeting of the independent Sheet mills is being held this (Tuesday) afternoon in the Hotel Henry, this city. Quite a number of the mills are represented and the present condition of the Sheet trade is under discussion. The matter of limit of output in union Sheet mills is also being considered. It is probable that the mills will make a united demand on the Amalgamated Association that the limit of output be removed. Demand for Sheets continues quiet, and the tone of the market is only fairly firm, concessions being made in cases where any desirable tonnage is involved. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.50c. to 2.55c., and No. 28 at 2.60c. to 2.65c. for carloads and larger lots. We quote Galvanized Sheets at 75, 10 and 2½ per cent. off for ordinary specifications in carloads, and 75, 10 and 5 per cent. off for desirable specifications and large lots. Jobbers charge the usual advances over above prices in small lots from store.

Rods.—There are no special features to note. We quote Bessemer and Open Hearth Rods at $34, and Chain Rods made from special stock at $35, Pittsburgh.

Spelter.—Prices on Spelter have declined to some extent and demand is dull. We quote Prime Western grades for early delivery at 5.45c., Pittsburgh. A lower price would be made for futures.

Tin Plate.—Demand for Tin Plate is dull and a number of the independent mills and also of the plants belonging to the leading interest are idle. There is no change in prices and we quote 100-lb. Cokes at $3.80, Pittsburgh.

Hoops and Bands.—There is a fair tonnage being placed in Hoops and Bands, but not nearly so heavy as at this time last year. We are advised that prices are being firmly held, and we quote: Cotton Ties, 87c. in 10-000-bundle lots or over; 92c. for carloads; Steel Hoops, 1.90c. in 250-ton lots and 2c. for carloads; Bessemer Bands, 1.60c. to 1.70c. for Open Hearth. Extras as per Steel card.

Skelp.—A local mill reports a sale of 500 tons of Grooved Iron Skelp at about 1.45c., Pittsburgh.

Merchant Steel.—A fair tonnage is being placed, but buyers are confining their orders to actual needs. Prices are only fairly firm, and for attractive orders our lower figures would be shaded. We quote: Open Hearth Spring, 2.15c. to 2.25c., base; Tire, 1.80c. to 1.90c.; Toe Calk, 2.25c. to 2.35c., base; Sleigh Shoe Steel, 1.90c. to 2c.; Cutter Shoes, tapered and bent, 2.25c. to 2.50c.; Plow Slabs, Bessemer, 2.10c.; Open Hearth, 2.35c.; Tool Steel, 6½c. to 12c. for ordinary grades; Shafting, 42 per cent. off in less than carloads and 47 per cent. in carloads, delivered, in base territory.

Pipes and Tubes.—A meeting of the independent Pipe mills was held at the Hotel Lincoln, this city on Thursday, October 22, but nothing of special interest was done. The condition of the trade as regards butt weld sizes of Pipe was discussed. Demand for the smaller sizes of Pipe is somewhat quiet, and concessions in prices are made. On the larger sizes trade is very good, and the mills are filled for several months ahead. Discounts to consumers in carloads, which for the smaller sizes are occasionally slightly shaded, are as follows:

	Steel.		Wrought Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inches	75	65	72	62
7 to 12 inches	69	59	66	56

Merchant Boiler Tubes.

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2½ inches	55½	38
2¾ to 5 inches	61	48
6 to 13 inches	55½	38

Scrap.—Dealers in Scrap advise us that inquiry is perhaps a little better, but the amount of Scrap that is changing hands is very small. Heavy Melting Stock has been offered as low as $14.50 in gross tons. No. 1 Wrought Scrap is $13.50 in net tons. Other grades of Scrap are lower in price, and the tone of the market is weak.

Coke.—A few of the outside operators in Coke are reported to have come to an agreement to maintain prices on the basis of $1.75 for Furnace Coke and $2.50 for Foundry. A very large number of ovens in the Connellsville region have been blown out, and production will be still further restricted on account of light demand. Strictly Connellsville Furnace Coke is $1.75 to $2 and 72-hour Foundry is $2.50 to $2.75 a ton at oven to consumers.

Joseph T. Ryerson & Son, Chicago, have opened offices in the Farmers' Trust Building, Pittsburgh, Pa., for the convenience of their trade tributary to that city. F. H. Russell is in charge of this branch office.

Birmingham.

BIRMINGHAM, ALA., October 26, 1903.

There was an increased inquiry for Iron the past week, and transactions in number were greater as well as in volume. Still the majority of orders were for limited lots. Buyers as a rule are not yet satisfied that the market is at "rock bottom" and are placing orders only as necessities prompt. But a few good orders have been placed at prices labeled to the public "private terms." A few buyers, anticipating that affairs were in a demoralized condition, have appeared in the market in person, prepared to pay cash on receipt of bill of lading, and after a thorough trial and failure to buy at their own figures, have left without adding to their holdings, and determined to chance the course of the market. The figures they had in mind varied from $9 to $9.50. They elected to wait further developments. Yet there are rumors that credulity is constantly circulating to the effect that buyers can name their own price for any amount they want. Efforts to obtain the actual prices at which sales have been recorded resulted in establishing the fact that the most noted feature of the market is its irregularity. The sales for the week cover prices ranging from $11.50 down to $10, based on No. 2 Foundry.

There were reports of sales on the basis of $9.75 for No. 2 Foundry, but the figures were obtained by deducting the commission of 2½ per cent. from the $10 sales, which left the next price of $9.75 for the seller. If these figures had been quoted to buyers there would have been more activity to the market. A careful investigation leads to the conclusion that $10 was the low point for the week to the domestic trade. One interest whose sales the past ten days amounted to 6000 tons shows an average price of $10.50 obtained. Another interest, whose sales were 16,000 tons, in the same time, obtained an equal average price. Others claim to have done fully as well. No. 2 Foundry sold at $11.50, $11.25, at $11, $10.75, $10.50, $10.25 and $10. The majority of the sales were below $11, and there were more booked from $10 to $10.50 than there were above $10.50. A few hundred tons of No. 2 Soft went at $11, and some Gray Forge was sold at $9. For No. 3 Foundry $9.80 was bid, cash on receipt of invoice, and was declined. To a majority of the orders was attached the condition of prompt shipment, showing that the purchases were induced by pressing necessities. There is a slight improvement in the tone of the market, due to the fact that the published sales show better prices than current rumor reported. There is a very important thing to consider at this stage and that is the cost of Iron making. At $10, if we have not reached that point, we are mighty close to it so far as a majority of our interests are concerned, and any further decline will be vigorously contested.

We have now seven to eight furnaces out of blast, and the probability is that there will be no great haste made to put them in again. There has been and is yet a good deal of activity in shipment, but the scarcity of cars is beginning to be felt and complaints are coming from shippers of inability to promptly obtain the cars they demand. There is no likelihood of any improvement in this regard. On the contrary, it is likely to grow worse. Warning of this condition has often been sounded in these letters. The L. & N. R. R. has in the last year added 4000 cars to the number available to shippers and yet is compelled, this early in the season, to rob its construction trains of its engines to help move the freight accumulating on this line, and systems whose territory is north of the Ohio River are giving notices to their Southern connections that they cannot give prompt transit to their tenders of freight. The business of the L. & N. R. R. so far this month is the largest of any like period in its history. The other roads make the same favorable report. Without exception they are all rushed to take care of the business being offered to them.

On Saturday the American Castings Company applied for a charter covering their business. The company are capitalized at $20,000 and are composed of home and Eastern parties. Geo. H. Harris is president, H. V. Dimmick is vice-president, D. H. Dimmick is general manager, and J. E. Dow is secretary and treasurer. They will make specialties, such as Flange Couplings, Screw Packs, Well Pulleys, Blind Hangers and all kinds of small castings. They are erecting a foundry, 50 x 150 feet, and a machine shop, 60 x 80 feet. It is a welcome addition to our diversified industries.

The Pennsylvania people who purchased the Palos Coal mines and other property have concluded the details of transfer and are now in possession of the property, and will largely increase the output. The company are capitalized

at $150,000, and W. E. Leake, formerly manager of the Virginia Coal Company, is manager of the Palos mines.

A new Coal field is being rounded up which contains the celebrated Black Creek Coal vein, rated as among our most valuable Coal seams.

The Pittsburgh & Southern Coal Company are making active preparations for a large shipping business to Mississippi River points, from which the Pittsburgh shippers are barred by low water. Everything so far points to an active trade for our coal interests. The great drawback to them is the probable shortage of cars.

After a session extending all the past week the differences between the Rolling mills and the Plate and Sheet men were settled by the men accepting a reduction of 12½ cents from last year's scale.

The cry for more labor still prevails, and it comes as well from contractors as from several of our industrial interests, and also from the various mines.

Nothing has been yet accomplished in the way of export business. A good many cablegrams have been exchanged, but there has been, so far, no coming together on a mutually satisfactory price. But those most interested are hopeful of a revival of that branch of business, and efforts will not be relaxed as long as there is a possibility of resurrecting it. There is such a comparatively small difference against sellers that, if the market showed a little firmness, they would feel greatly encouraged to press their efforts in that direction. Though unsuccessful so far, they are not without hope of success crowning their efforts in the near future.

The New York Machinery Market.

NEW YORK, October 28, 1903.

Notwithstanding the absence of any large proposition to brace it up, business continues fair and unchanged in character from that of the previous week, it being wholly composed of small orders. No specifications of even small magnitude have appeared in the street, and none of those that have been "hanging fire" for so long have been heard from. As winter draws near merchants are becoming more hopeful of a substantial increase in business, especially from the West and South, from both of which points reports indicate a very promising outlook. It is generally believed that there is to be an early resumption of business on a sounder basis. While inquiries are not more numerous than they have been, they are bringing results. Purchasers are coming more freely into the market, and the hesitancy to place orders, so apparent during the summer months, is gradually disappearing.

The contract let last week by the Pennsylvania Railroad for the construction of their new shops at Fairview, opposite Harrisburg, Pa., brings up again the question of what they intend to do in the way of purchasing equipment. This is probably one of the greatest propositions ever before the trade, including, as it does, the construction and equipment of a large number of new buildings at an estimated cost of several million dollars. The first of the year is the time when the road usually make appropriations for improvements, and speculation is rife as to whether they will then make provision for the entire amount. In well informed circles it is understood that the greater portion will be provided for and that the specifications will be issued either the last of November or early in December. Contracts have also been let within the past few days amounting to $2,500,000 for the Pennsylvania's new terminal station in Washington. This amount is stated to be only part of the cost of the structure, which will require a large power plant and a quantity of ventilating apparatus.

Purchases of equipment are now being made by the Hammond Iron Works, Warren, Pa., to replace that lost in their recent fire. The Chicago Pneumatic Tool Company, New York, received the order for an air compresser and pneumatic tools. Operations have been resumed by the Hammond Company under a temporary frame structure over the ruins of the old plant, and they expect to be in full operation in about six weeks.

It is expected that the Allentown Foundry & Machine Company, Allentown, Pa., will soon purchase the equipment for their new plant, which is rapidly approaching completion. The main building is 80 x 201 feet, and two and one-half stories high. It will be equipped with modern machinery, including an electric traveling crane, which will extend the entire length of the shop. There will also be a new blacksmith shop, 30 x 64 feet, and an office building, 20 x 50 feet.

The announcement by Secretary of Navy Moody that the Midvale Steel Company of Philadelphia, Pa., will be awarded contracts for 6000 tons of armor plate has aroused considerable interest in the street, from the fact that the company will have to erect a new plant and will require considerable machinery.

The Ferracute Machine Company, Bridgeton, N. J., whose plant was recently destroyed by fire, have not yet developed plans for rebuilding. They are, however, putting up a small, temporary shop which will be run in connection with another small shop a couple of hundred yards away which they have rented. The net loss caused by the fire was about $150,000, and not $100,000 as was reported. The plant was insured for $118,000.

A power plant of considerable size will be required for the group of new buildings for the College of the City of New York, plans for which have been filed by the architect, George B. Post. The buildings are to be five in number, partly connected by a subway, and will cover an irregular area extending from Amsterdam avenue to St. Nicholas Terrace, and from 138th to 140th street. They will cost $2,500,000. The engineer for the mechanical equipment has not yet been selected.

Further details of the proposed new plant of the United Lead Company at Granite City, Ill., are now at hand. Three buildings, one 50 x 200 feet; one 50 x 300 feet, and one 150 x 200 feet, will be erected at once. These are to be occupied by the Hoyt Metal Company, whose plant will be moved from St. Louis, and as their capacity is to be doubled, the first equipment that will be purchased will be a modernized duplicate of that now in use by the Hoyt Company. Following the completion of these buildings a large pipe and sheet plant will be erected and then the white lead works. The company have arranged for the necessary power to operate the first group of buildings, but when plans are developed for the other works they will include a good sized power plant. E. R. Hoyt, vice-president of the United Lead Company, 71 Broadway, New York, has the matter in charge.

The United States Steam Turbine Company, New London, Conn., whose proposed new plant was fully described in these columns last July, are having their first engine manufactured at the shops of D. E. Whiton & Son. While no definite information as to when the plant will be erected is at hand, the company have decided to locate in Norwich.

A recommendation has been received from the Rock Island Arsenal for an appropriation of $75,000 to cover the cost of new machines needed in the manufacture of the new army rifle. Since the two appropriations made by the Government for the establishment of the small arms plant were originally granted, the War Department has adopted a new magazine—of the model of 1903—which differs materially in some parts from the arm formerly manufactured. The plant as now installed contemplated the manufacture of the knife bayonet and its scabbard. In the new rifle the knife bayonet has been abandoned and the rod bayonet substituted.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until December 5 for three locomotive jib cranes of 40 tons capacity each for the Boston, Puget Sound, Wash., and Portsmouth, N. H., navy yards.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until November 28 for constructing an extension of the coaling plant at the naval station, New London, Conn. Funds available, $24,700.

The following bids were opened at the Bureau of Supplies and Accounts, Navy Department, Washington, October 20, for supplies for Mare Island Navy Yard:

Bidder 5. Tatum & Bowen, San Francisco, Cal.
11. Bement, Miles & Co., Philadelphia.
33. Buffalo Forge Company, Buffalo, N. Y.
40. Niles-Bement-Pond Company, New York.
58. Detrick & Harvey Machine Company, Baltimore, Md.
82. Drew Machinery Agency, Manchester, N. H.

Class 23. Puget Sound—1 horizontal boring, drilling and milling machine—Bidder 40, $7390; 11, $8200; 58, $8950.

Class 24. Mare Island—1 double steel plate planing mill exhauster and 1 motor and controlling panel—Bidder 5, $255; 82, $1006 and $1526; 33, $1746.94 (?).

The following awards have been made for supplies for the Puget Sound Navy Yard, bids for which were opened October 6:

Este Dynamo Works, Belleville, N. J., class 8, 12 motors, $1662.24.

Pacific Tool & Supply Company, San Francisco, Cal., class 15, one tool room lathe, $610; class 22, one square arbor lathe, $850; class 26, one universal grinding machine, $1060.

Niles-Bement-Pond Company, New York, class 23, one horizontal boring machine, $1540.

Prentiss Tool & Supply Company, New York, class 24, one single spindle reversible shaper, $324.

Thompson Electric Works, Chicago, Ill., class 9, three motors, $565.

Tatum & Bowen, San Francisco, Cal., class 10, one electric elevator, $3982; class 25, one knife grinder, $225.

George E. Dan Pumping Engine Company, San Francisco, Cal., class 11, one pumping outfit, $1460.

Holtzer-Cabot Electric Company, Boston, Mass., class 12, one exhaust fan, $94.

O. P. Mooney, Seattle, Wash., class 13, one revolving blue print machine, $370.

Halliday-Hensnaw-Buckley Company, Seattle, Wash.,

class 14, one turret lathe, $1614; class 18, one upright drill press, $324; class 19, one metal band saw, $335.

Richard & McCune, San Francisco, Cal., class 16, one center grinding machine, $46.

Class 20, one milling machine, will be purchased in open market.

Class 21, one bench lathe, no award.

The following awards have been made for supplies for the New York Navy Yard, bids for which were opened October 16:

Manning, Maxwell & Moore, New York, class 27, 30 forges, $784.20; class 30, one 20-foot squaring shear; class 32, one universal milling machine, $600.

Holtzer-Cabot Electric Company, Boston, Mass., class 1, one electric portable blower, $118.

Marshall T. Davidson, Brooklyn, N. Y., class 28, 19 pumps, $4665.

Prentiss Tool & Supply Company, New York, class 29, one pattern maker's lathe.

Baird Machinery Company, Pittsburgh, Pa., class 31, one 36-inch band saw, $102.

The negotiations whereby the Pittsburgh Coal Company of Pittsburgh, Pa., secure a majority of the stock of the Monongahela River Consolidated Coal & Coke Company were closed in that city on Tuesday. The deal was first announced of September 2, when it was given out that the Pittsburgh Coal Company had agreed to take over 300,000 shares of the common stock of the Monongahela Company at $15 per share, and 50,000 shares of the preferred stock at $45 per share The contract price for the common stock was $4,500,000 and the preferred $2,250,000, making a total of $6,750,000, for which notes have been deposited. The Pittsburgh Coal Company have three years in which to pay for the common stock, while the preferred stock will be paid for on a production basis, and five years will probably be required to complete the payments of the entire purchase money.

A member of the McCullough-Dalzell Crucible Company, Pittsburgh, Pa., has just received what is probably the largest lump of crucible clay ever brought into America, and gives some interesting data of the old town of Klingenberg, Germany, whence comes the Crown clay used in making their crucibles. The citizens own the clay beds in common and divide all profits. Hours of work are few, holidays many, and the yearly output is closely restricted. Orders must be placed months ahead, or lie over until another year, being filled absolutely and impartially in rotation. But so perfect is the clay that the McCullough-Dalzell Crucible Company are forced to conform with the city's requirement and make up their orders in advance of needing them.

The strike of machinists at the East Pittsburgh works of the Westinghouse Machine Company has been officially declared off, and orders have been sent out from headquarters of the International Association of Machinists to the different district lodges in the country to settle all existing strikes as speedily as possible. The cause of this change in front on the part of the association is said to be the threatened wage reduction in various quarters and the prospects for employment during the winter months, which are not particularly bright.

After seven weeks' strike at the Jeffersonville, Ind., branch of the American Car & Foundry Company a settlement has been reached and the men have gone back to work. There were 150 employees directly involved and 500 others laid off on account of the strike. The company refuse to recognize the union, but give an advance in wages of 6 to 10 per cent. The demand for nine hours instead of ten was abandoned by the men. It will take two years to make up by the increase in wages the amount the men have lost by the strike.

Work is rapidly nearing completion on the third of the trio of furnaces at the Port Oram, N. J., group operated by Joseph Wharton. The new stack will have a capacity of 400 tons, and is being constructed along the most modern lines known in blast furnace engineering. The work is being carried on under the superintendency of Edward Kelley, manager, and the designers, the engineering firm of Frank C. Roberts & Co., Philadelphia. The plate construction was done by the William B. Pollock Company, Youngstown, Ohio, blast furnace builders.

Independent Sheet Manufacturers' Association.

(By Telegraph.)

PITTSBURGH, PA., October 28, 1903.—A meeting of the Independent Sheet Manufacturers' Association, organized several months ago, was held in the Hotel Henry, Pittsburgh, on Tuesday, October 27. There was a very full attendance of the mills, and James A. Campbell was chairman and James H. Nutt secretary. The principal object of the meeting was to discuss the question of limit of output in union sheet mills which sign the Amalgamated scale and also limit of time. The latter question, however, was not discussed to any extent, but the question of limit of output was the principal one before the meeting. It will be recalled that a month or more ago the independent sheet mills who sign the scale asked the Amalgamated Association to remove this limit of output in order to put them on an equal basis with the nonunion mills, which have no limit of output. A meeting of the vice-presidents of the Amalgamated Association was held, and an answer was returned to the independent sheet mills to the effect that this was a question that would have to come before the regular convention of the Amalgamated Association, to be held in May next year. This reply was unsatisfactory to the independent sheet mills, and at the meeting yesterday a resolution was passed asking that the president of the Amalgamated Association immediately take steps to have the limit of output in union sheet mills removed. It was pointed out that sheet mills in which the limit of output exists are unable to compete with the nonunion sheet mills, and it is insisted that the Amalgamated Association remove this limit of output at once. In case of failure to do so, it is not improbable that a number of union sheet mills will repudiate the Amalgamated Association and run nonunion, this having recently been done by the Stark Rolling Mill Company at Canton, Ohio, who are now operating their sheet mills nonunion and to full capacity. A reply from the association is expected within a very short time.

A Wheeling Consolidation.—Plans are under way for the consolidation of the Whitaker Iron Company, Wheeling Corrugating Company and the Laughlin Nail Company of Wheeling, W. Va., and the Portsmouth Steel Company of Portsmouth, Ohio, under the leadership of the Whitaker Iron Company. While details of the merger have not yet been effected, there is little doubt but that the deal will be consummated, as it simply means the merging into one company of the various interests controlled by the same parties. The Wheeling Corrugating Company are owned by the Whitaker Iron Company, who, in connection with the Laughlin Nail Company, control the Portsmouth Steel Company. The products of the companies are open hearth steel, sheet bars, charcoal blooms for boiler tubes, iron and steel sheets, black plates for tinning, galvanized sheets, tin and terne plates, nails and spikes. It is stated that the new corporation are to be capitalized at $10,000,000.

The North Star Iron Works of Griffith, Ind., founders, machinists and manufacturers, will remove about November 15 to their new plant at Hammond, Ind., where the business will be continued by the owners, B. B. Potter and R. T. Dodge.

The new battle ship "Missouri" has proved herself queen of the seas in her class in a speed trial over the Cape Ann course, with weather conditions against her. Over a course of 33 nautical miles and return she made an average speed of 18.05 knots per hour, which with tidal corrections greatly in her favor will advance it to 18.22 knots, a new world's record for battle ships of her class. She at one time attained a speed of 18.75 knots per hour.

New York.

NEW YORK, October 28, 1903.

Pig Iron.—The market has steadied somewhat, and we note purchases by one interest of about 5000 tons of Northern Iron. The furnace interests of Eastern Pennsylvania are to meet on Monday next at Philadelphia to act on the plan of restriction. Consumers are pressing for deliveries and are evidently very bare of stock. Under the circumstances one matter needs consideration so far as purchasing Southern Iron is concerned, and that is the time which must necessarily elapse before Iron ordered is delivered. There is a good deal of talk about exports, but little has been done. We quote Northern No. 1 X Foundry, $15.50 to $16; No. 2 X Foundry, $14.75 to $15.25, and Gray Forge, $14 to $14.50, tidewater. Basic is quoted $14 to $14.50, delivered. Tennessee and Alabama brands are quoted: $14.50 to $14.75 for No. 1, $13.75 to $14 for No. 2, and $13.25 to $13.50 for No. 3.

Steel Rails.—A meeting of the presidents of the Steel Rail companies is being held in this city as we go to press. During the week no transactions of any magnitude are reported. There is some export inquiry, but, aside from an order for New South Wales taken some weeks ago, nothing of consequence has been done. We continue to quote Standard Rails $28 at mill, and 25-lb. Rails, $29 to $30.

Cast Iron Pipe.—While no contracts involving any large quantities are at present in sight, the demand for small lots running up to 150 tons continues quite active, and Eastern foundries are maintaining their regular daily output. It is expected that the Brooklyn department of the New York municipal system will in the early future call for a heavy tonnage. Carload lots of 6 to 10 inch are still quoted at $30 per gross ton, at tidewater, and 12-inch upward, $29.

Finished Iron and Steel.—The market generally is feeling the effects of a change in the attitude of buyers. Business which had been quite confidently expected does not materialize; projects for improvements being postponed, either on account of financial conditions or to await a possible reduction in price. The leading structural interest will close this month with about 33,000 tons booked for October, which is considerably below the average. At the moment they are in as good condition as at the corresponding time last year, with about as much unfilled tonnage on their books. The New York City Bridge Commissioner is again calling for bids on the Steel superstructure for the new Blackwell's Island bridge, to be opened November 5. The entire work must be completed by January 1, 1907. This contract will require from 45,000 to 50,000 tons of Steel. The Plate trade is not active, but sales agents report a fair run of small orders. The largest inquiry in hand at present is said to be not over 200 tons. Some expectation prevails that the demand may shortly improve from shipbuilding interests. Bar Iron is quiet, with prices ruling as recently reported, the mills making good quality maintaining their prices. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.85c. Sheared Steel Plates, in carload lots, are 1.78c. to 1.85c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.25c. upward for Fire Box. Refined Bars are 1.55c. to 1.70c.; Soft Steel Bars, 1.70c. to 1.80c.

Old Material.—Almost nothing is now doing in Old Material, with the exception of Cast Scrap, which is in moderate demand. All prices are lower. Railroad companies are offering increasing quantities of accumulated material on which they are receiving such unsatisfactory bids that they are unwilling to sell more than a mere fraction of such offerings. Sales of Relaying Rails are still limited to exceedingly small quantities. Quotations continue nominal, with approximate figures as follows per gross ton, New York and vicinity.

Old Iron Rails	$16.50 to $17.50
Old Steel Rails, long lengths	15.00 to 16.00
Old Steel Rails, short pieces	11.00 to 12.00
Relaying Rails, heavy sections	.... to 20.00
Old Car Wheels	15.00 to 16.00
Old Iron Car Axles	17.00 to 18.00
Old Steel Car Axles	16.00 to 17.00
Heavy Melting Steel Scrap	11.00 to 12.00
No. 1 Railroad Wrought Iron	14.00 to 15.00
Iron Track Scrap	12.00 to 13.00
Wrought Pipe	9.00 to 10.00
Ordinary Light Iron	5.00 to 6.00
Cast Borings	3.00 to 4.00
Wrought Turnings	8.00 to 9.00
No. 1 Machinery Cast	11.00 to 12.00
Stove Plate	6.00 to 7.00

The annual meeting of the stockholders of the United Engineering & Foundry Company was held in their offices in the Farmers' Bank Building, Pittsburgh, Pa., on Tuesday, October 27. Four directors whose terms had expired were re-elected.

Metal Market.

NEW YORK, October 28, 1903.

Pig Tin.—Manipulation in London brought about a sharp rise in that market toward the end of last week, and Pig Tin prices here were advanced in sympathy, both on spot and futures. Little or no stimulation of the domestic demand resulted, however, although some speculative deals were transacted in futures. With increased available supplies here and continued reluctance to contract on the part of consumers, the market has softened again this week and closed quiet and easy. The premium on spot has disappeared again. Offering prices to-day were: Spot, 25.75c.; November, 25.67½c. to 25.90c.; December, 25.65c. to 25.90c. London cable was £118 to 118 10s. The arrival of the "Minnehaha" on Monday with 1065 tons has brought the arrivals of Tin at Atlantic ports since October 1 up to 3810 tons, with 1035 tons afloat. Consumers seem to be holding out of the market through want of confidence in the situation, the recent fluctuations in prices having been notoriously caused by speculative manipulation, quite apart from the question of supply and demand.

Copper.—The protracted dullness of the Copper market was broken into at the close of last week by the announcement that the Amalgamated Copper Company had determined to suspend operations at their Montana mines pending the outcome of the present controversy in regard to their properties. The fact that such action would mean a curtailment of output amounting to some 10,000 tons a month gave unusual interest and importance to the move. It acted like a tonic on the sluggish market and sent up the official prices for all grades of Copper ⅞c. over the figures quoted in our last week's report—namely, to 14c. for Lake, 13¾c. to 13⅞c. for Electrolytic and 13¾c. for Casting. The rise was accompanied by considerable excitement on Monday, some consumers who had been staying out of the market while its course was gradually downward coming in for supplies, fearing further advances. The aggregate of such transactions, however, was not very heavy, and the excitement was short lived, disappearing within 24 hours, and the market relapsing into dullness accompanied by an easy tone. The impression generally prevails among the well informed that available stocks of Copper in this country, stock market assertions to the contrary notwithstanding, are accumulating, while the consumption is below the average, and that these facts had more to do with the action of the Amalgamated Company than the ostensible reason given in their announcement above referred to. The action of the Sheet Copper manufacturers last week in reducing prices 2c. a lb. was also taken as an indication that large consumers do not look for scarcity of metal or materially higher prices in the near future. All of which makes clearer the present lack of interest in the market on the part of consumers and its return to easy conditions after the brief show of strength on Monday. While the "official" quotations, as above given, were unchanged at the close to-day, these prices could be very generally shaded ¼c. The advance here on Monday sent London prices up to £60 5s. for spot, but the market there has since declined sharply, closing easy at £58 7s. 6d. for spot and £57 15s. for futures. Best Selected was quoted at £64 10s., an advance of £4 5s. over last week's quotation.

Pig Lead.—The market has continued steady and is without new feature. Demand is moderate and spot supplies still somewhat scarce. Spot Lead is firm at 4.50c. The American Smelting & Refining Company continue to quote Desilverized at 4.40c. for 50-ton lots and 4.42½c. for carload lots, New York delivery, shipment within 30 days. The London price at the close to-day was £11 5s St. Louis reports 4.25c.

Spelter.—The spot market retains its firmness, notwithstanding that transactions are comparatively light. Futures have stiffened again. Supplies for quick shipment are still limited. Spot metal rules at 6⅛c. The London market was £20 15s. at the close, and St. Louis quotation 5.60c. for spot.

Antimony.—The market is dull and easy. Cookson's has declined to 7c. Hallett's i unchanged at 6¼c., and other brands at 5¾c.

Nickel—Is without change, 40c. to 45c. being quoted for large lots, and 50c. to 60c. for smaller quantities.

Quicksilver.—Business is fair at $47.50 for flasks of 76½ lbs. London cables £8 10s.

Tin Plate.—No change has taken place in this market. Transactions are mainly in jobbing lots, and business, as a whole, is of a light order. Prices are unchanged. The American Tin Plate Company quote $3.80 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to $3.99, New York.

The United States Glass Company of Pittsburgh, Pa., have decided to reduce their capital stock from $5,000,000 to $3,200,000 by retiring the entire preferred stock of $1,000,000 and $800,000 of the common stock. It was decided to create a bonded indebtedness of $770,000 for the purpose of retiring the preferred stock.

Iron and Industrial Stocks.

The general tendency of the stock market during the past week has been toward improvement. A few cases occurred in which industrial shares were adversely affected by special conditions. Weakness developed in Republic, caused by the rumor that a reduction was likely to be made in the dividend on the preferred stock. Under this pressure, Republic, common, fell to 7½ on Thursday of last week, and the preferred to 51½. The rumor was pronounced absolutely without foundation by the officers of the company and the stock promptly recovered. On Friday Chicago Pneumatic Tool sold down to 30 in Chicago, as compared with 35 on the previous day. This also was a special matter, and not in line with the general market. It is said to have been due to forced sales of stock on which loans had been made. Highest and lowest prices on active industrials during the week were as follows: American Can, preferred, 29 and 27¾; Car & Foundry, common, 22 and 20½; preferred, 68 and 66; Locomotive, common, 14¼ and 13⅛; preferred, 75⅛ and 73¾; Colorado, 33½ and 28; Crucible, common, 4⅝ and 3⅛; preferred, 32¾ and 28½; Dominion Iron & Steel, 9¾ and 8½; Pressed Steel, common, 32½ and 31; preferred, 72½ and 71; Republic, common, 8 and 7⅛; preferred, 55⅛ and 51½; Sloss-Sheffield, common, 26¼ and 25⅛; Tennessee, 30¾ and 28½; United States Steel, common, 14½ and 13½; preferred, 60½ and 58; new 5's, 72½ and 71⅛. Last sales up to 1.30 p.m. on Wednesday of this week were as follows: Can, preferred, 29; Car & Foundry, common, 19; preferred, 65½; Locomotive, common, 13¼; preferred, 75; Colorado, 31½; Pressed Steel, common, 29¾; preferred, 70½; Republic, common, 7½; preferred, 52½; Sloss-Sheffield, common, 26¼; preferred, 66; Tennessee, 29; Steel, common, 13¾; preferred, 59½; new 5's, 72.

It is said on good authority that the Monongahela River Coal & Coke Company of Pittsburgh are earning at the present time more than $1,000,000 a year on the common stock. This being the case, it is thought not at all unlikely that the new management will declare dividends on the common at the rate of 4 per cent. per annum. Such dividend would require only $800,000, and of this sum $600,000 would go to the Pittsburgh Coal Company as the purchasers of 75 per cent. of the common stock issue under their contract with Mr. Whitney.

Dividend.—The Standard Sanitary Mfg. Company of Pittsburgh have declared the regular quarterly dividend of 1¾ per cent.

Notes from Great Britain.

The Markets.

LONDON, October 16, 1903.—The most important market statement this week is that the Scotch iron makers have reduced their prices for iron bars by 5 shillings per ton all round. Crown bars are now quoted at £6 5s per ton, less 5 per cent., delivered in Glasgow. This compares with £6 7s. 6d., less 2½ per cent., quoted by North of England makers, delivered in their district. The Scotch makers have also reduced tube hoops by 2 shillings 6 pence per ton to £6 5s. per ton, net, delivered in Glasgow. In England there is no marked quickening of the iron trade as the result of the Birmingham quarterly meeting. Complaints are common all the way round that the contracts given out on that occasion were very inadequate.

In pig iron transactions are few and of limited weight, but on the other hand there is a fairly even balance as between its production and consumption. Some smelters report that their output for the remainder of the year is well covered. In such cases quotations naturally are firm, but generally speaking the tone of the market is less strong than a few weeks ago.

Profits and Dividends.

The annual report of Baldwins (which is a trust or an amalgamated firm) for the year ended June 30, states that the profits on manufacturing and trading accounts, &c., for the year, after providing for discounts, amount to £110,446 19s. 5d. Deducting directors' fees, managing directors' remuneration, debenture trustees' fees, income tax, auditors' charges, &c., £10,000 for depreciation, and £5651 for premiums on sinking funds for the redemption of debenture stock and leasehold properties, leaves a balance to be apportioned of £82,341. The payment of debenture interest to date takes £11,077; the amount required for the preference dividends from the formation of the company to June 30, 1903, is £14,447 (which includes the dividends payable on August 1, 1903); and for the balance of interest due to vendors, £3611. The directors have decided to write off at once the balance of preliminary expenses, £6790, and to charge against the year's revenue the sum of £30,259, which has been expended in still further bringing the works up to the highest standard of efficiency. After placing £5000 to a reserve for contingencies, there is left the sum of £11,145 to be carried forward to the credit of the current year's account.

The firm of John Henry Andrew & Co., Limited, of the Toledo Works, Sheffield, the death of whose managing director is noted above, pay a dividend of 10 per cent. on the year, while adding a substantial sum to the reserve fund and making due provision for depreciation.

The great amalgamated firm of Richardsons, Westgarth & Co. report a profit of £79,594, which, with the outstanding balance, leaves £90,210 for distribution of profits. After paying 4½ per cent. debenture and 6 per cent. preference, 6 per cent. is also paid on the common stock. In view of the depression in the engineering and shipbuilding trades during the year, the directors think that the results are satisfactory.

In the earlier stages of the Bengal Iron & Steel Company's career this company's dividends were either small or nonexistent, but latterly fair profits have been earned and distributions of 10 per cent. made on the ordinary shares. The interim report, just issued, shows that the prosperity of the undertaking is, on the whole, well maintained. Good progress has been made with the construction of steel works, and it is expected that the manufacture of steel will be commenced in March next. Meanwhile the company have been fortunate enough to secure a contract for the supply of 12,000 tons of pig iron per annum to the principal Indian railways.

Testing Water Tube Boilers.

The Boiler Committee of the Admiralty this week embarked on a long distance endurance test of the Babcock & Wilcox boilers in the second-class cruiser "Hermes," a boat which has done well throughout the whole series of her trials of various powers. Following upon this run the "Medusa" and "Medea," third-class cruisers, will be required to steam at their best sea speed as long as the coal in their bunkers will last, with the view of testing the endurance of the Yarrow and Durr water tube boilers with which they are now fitted. The committee at their last meeting examined the engineers to ascertain how these vessels behaved during the manœuvers, and favorable reports were made in both cases, although there is a distinct preference for the Yarrow type.

Sorbitic Steel.

With reference to the papers read at the recent Iron and Steel Institute at Barrow by T. E. Stead and A. W. Richards, the question is asked if, after noting what can be done in improving steel by proper heat treatment, it is possible for any iron or steel metallurgist to continue to move in the old ruts? J. Beardshaw & Sons, Limited, the well-known steel manufacturers of Sheffield, answer this question as follows:

> We as steel makers are pleased to answer this question in the negative, and to say that we can produce upon a commercial scale ordinary carbon steel in bars, plates and forgings, in which, as a result of a thermal treatment, sorbite is fully developed. Our Conqueror sorbitic steel is of a very uniform and homogeneous character, and when tested in the usual way will be found to give the following minimum results—viz.: A tensile strength of 52 tons per square inch, with an elastic limit of 40 tons and an elongation of 20 per cent. in a 2-inch test length. When subjected to the cold bend or impact test, it will be found to give results that far surpass those that can be obtained with any other steel, even including nickel steel.

S. G. H.

After the annual meeting of the stockholders of the Republic Iron & Steel Company on Wednesday, October 21, the board of directors elected the following officers: Alexis W. Thompson, president; John F. Taylor, Archibald W. Huston, Wm. H. Hassinger and George A. Baird, vice-presidents; John F. Taylor, treasurer; H. L. Rownd, secretary; G. Watson French, chairman of Executive Committee. George A. Baird will continue to act as general sales agent.

Cincinnati Machinery Market.

CINCINNATI, OHIO, October 24, 1903.

In looking over the situation of the machine tool interests of this city we cannot be impressed otherwise than that conditions, instead of growing brighter and more hopeful, are to a certain extent putting on a more straightened and unhealthful appearance. Apparently there is very little transpiring out of the ordinary. Several of our largest shops are working on shorter time, and rumor has it that some of them have even gone so far as to reduce their working force. This would seem to indicate that that which was promised and which looked as if there could be no such thing as failure, had concluded not to materialize. To prophesy as to what the future may bring forth is almost impossible, and while many of the manufacturers are not very sanguine as to the outlook, still there is a disposition among them to look for a clearing up of the horizon by the holiday time at farthest. The influence of the unstableness of the stock and money markets seemingly is the most potent factor in causing existing conditions. As was remarked by one of our largest manufacturers, Wall Street seems to be able to raise and lower stocks without any regard to their market value whatever. With this proposition confronting trade, and the pig iron market still seeking a lower level, there is little wonder that purchasers are becoming more careful and conservative.

Last year at this time order books were being rapidly filled with no apparent effort, the trade seeking the manufacturer direct, but now they are up against an entirely different proposition. Traveling men are being called into requisition, and the manufacturer is compelled to use all the means at his command to seek a market for his product. There are, of course, exceptions to this rule, and several shops show no sign of this decrease in new business, as they were so far behind with orders received months since they are happy to be allowed an interval in which to clean up old scores.

A number of concerns which had decided making important additions and improvements to their plants, are now undecided as to the outcome of present conditions, and are waiting for future developments before proceeding further in this line. Last year at this time it was extremely difficult to secure competent machinists, while at the present writing there seems to be an abundant supply. The Executive Council of the National Metal Trades Association held their meeting in this city last week. Their reports demonstrated the fact that there was quite a falling off in the industry, attributed chiefly to the high price of materials. They discussed the associations of the various employers, and had up the question as to whether or not they should join the National Federation of Employers and resist the inroads being made upon them by the labor unions.

The John Van Range Company are erecting a ferro-concrete building for the manufacture of stoves and ranges at the southwest corner of Fifth street and Broadway, this city. It is planned to make it a four-story building, but the columns, uprights and foundations will be constructed so that if it becomes necessary on account of a deal now pending, the work can be continued until the building reaches a hight of eight stories. The lot which this building will cover is 146 feet front on Fifth street by 94½ feet on Broadway. The cost is esimated at $130,000. The contractors are the same who are putting up the Ingalls Building. They expect to have this building ready for occupancy by June next.

The American Tool Works Company state that they are receiving a large number of inquiries, but buyers are holding off with their orders. They have recently consolidated several of their departments and changed the location of building certain of their tools with a view to the better handling of the same. They report that trade in October shows quite an increase over that of September, and the outlook is brighter than for several months past. They are now placing on the market a new motor driven lathe, with an all geared head adapted to any type of motor, which they anticipate will prove very attractive to the trade. They will within the next week have for distribution a new catalogue which describes in brief their line of tools.

The Lodge & Shipley Machine Tool Company are having a larger demand for special machines, and report foreign trade as somewhat improved. They are, however, working shorter hours, and while inquiries are numerous, orders booked are only fair. They are of the opinion that trade will resume its normal condition within the next four months.

The John Steptoe Shaper Company are working full time and report that they are unable to make any stock ahead. Export business with Denmark, Holland, Sweden, Australia and Cuba is good, and they have made several very large shipments of their tools to these points.

The McGovern Tire Setter Company have recently introduced to the trade a new nub banding machine which will prove another money saving machine for the carriage trade. In construction the machine is very simple and is quite easy to operate. It is built to compress on cold the outer, inner and middle hub band. The setting of the bands is done by a set of six jaws or dies, which are turned out to a perfect circle to fit the hub properly. These dies are made into any size to fit all requirements, and the machine will band from the very smallest size up to the largest size hub. The only change for this work is the setting in and taking out of the different sized dies. These dies are fastened on tight to six gates. These gates are provided with six eccentric blocks and into these eccentric blocks run the six eccentric shafts. On these eccentric shafts are six large gears. When the power is turned on these gears and eccentric blocks which close the dies all operate together, always keeping a perfect circle. It is claimed that in a full carload of hub blocks there is fully more than 50 per cent. lost by reason of the excessive size season cracks. The use of this machine it is expected will save fully 95 per cent. of this usual loss, hence these machines ought to find a very important use among manufacturers of hubs, wheels and vehicles. Then again, there are so many uses that this machine can be put to that it is really almost indispensable to any well equipped vehicle shop.

The Rahn-Mayer-Carpenter Company state that during October they sold the equivalent of their production, which was very satisfactory indeed. They now have several large contracts booked, which will carry them into the winter months, at which time they feel confident conditions will be better.

The Blymyer Mfg. Company maintain that in their line trade is all that can be desired. Many plantations in the South are being developed and extended, and the demand for sugar mills to supply this section is of the best. They recently shipped to the Vera Cruz Development Company of Canton, Ohio, whose plantation is on the Isthmus of Tehuantepec, a complete still house outfit, whereby they make alcohol from sugar cane. This machine has a capacity of from 800 to 1000 gallons per day, and the shipment consists of 12 carloads.

The new plant of the Cincinnati Machine Tool Company is progressing in a very rapid and satisfactory manner. Trade with them is excellent, and the conditions existing for some months since are apparently unchanged.

The Sebastian Lathe Company, builders of 9 and 15 inch foot and power lathes, report quite a letting down of orders in the past few months. They think, however, that when general conditions are once more on a firm basis trade will be what it was several months since.

The Houston-Stanwood & Gamble Company, manufacturers of slide valve steam engines, say that October has been a month in which they have been exceedingly busy. Their order books show no falling off, the majority of their trade coming from the South. They now have under construction a 50 horse-power outfit of engine and boiler for J. H. Shearer & Co., Monticello, Ky., a 70 horse-power outfit for M. E. Gillette, Tampa, Fla.; an 80 horse-power engine for the Quemahoning Coal Company, Pittsburgh, Pa.; an 80 horse-power engine for Davis & Co., Hattiesburg, Miss.; a pair of 350 horse-power engines for the Warrentown Lumber Company, Warrentown, Ore.; a 250 horse-power engine for the Lindsay Lumber Company, Pollard, Ala.; a 250 horse-power engine for the Springfield Lumber & Cooper Company, Mosher, Ark.; a 125 horse-power engine for Stevenson Company, Wellsville, Ohio; a 250 horse-power engine for the Napoleon Cypress Company, Napoleon, La.; a 300 horse-power engine for Baker, Wakefield Cypress Company, Plattenville, La.

The I. & E. Greenwald Company, makers of engines and gears, are an exception to the general rule and state that with them trade is just as heavy as it has been for the past year. In addition to orders booked, they are called upon to do considerable estimating, and they anticipate that when the year closes it will prove to have been one of their very largest. They recently installed one of their large engines in the Cincinnati Milling Machine Company's plant, shipped one very large engine for the Otto Marmet Coal & Mining Company for West Virginia points, one 250 horse-power engine and large coal digger for the Monongah River Consolidated Coal & Coke Company, Pittsburgh, Pa.; one 200 horse-power engine for Ohio Knife Company, this city; one 250 horse-power engine for the Victor Stamping Company, Loveland, Ohio; one very large engine for the Cincinnati Planer Company, one 250 horse-power engine for the Bromwell Brush & Wire Goods Company, one direct connected engine for the R. K. Le Blond Machine Tool Company, one large direct connected engine for Ault & Wiborg Company, this city, and a large compound engine for United States Roofing & Tile Company, Parkersburg, W. Va.

The Bridgeport Safety Emery Wheel Company of Bridgeport, Conn., are building a new grinder, driven direct from a Crocker-Wheeler motor. The motor is specially wound to give the low motor speed of 600 revolutions, which in the case of the No. 4 machine is intended to drive a 20-inch wheel with 2½-inch face. The motor speed may be increased as the wheel wears away to 1000 revolutions for a 14-inch diameter.

HARDWARE.

ONLY those who keep in close touch wth the trade are aware of the extent to which the Hardware field is broadening out so as to include classes of goods which are not strictly Hardware. The changes which are taking place in business involve the tendency to obliterate the subdivisions of trade, according to which lines which we now consider related were formerly kept apart and handled by different merchants, so that at the present time a far greater variety of goods is found in a representative up to date Hardware store than heretofore. How great this variety is will be seen from the table which is given below.

The following table is a synopsis of reports received from Hardware merchants in all parts of the country in reply to an inquiry as to the lines of goods they regularly handle. The names of the parties thus addressed, who represent every State and Territory, were selected indiscriminately from the lists of retail Hardware merchants who are subscribers to *The Iron Age*, and their business is thus representative in a general way of the trade at large. The proportion of these houses carrying the various lines named is indicated by the percentage given. Thus 66 per cent. of the merchants whose reports are thus summarized handled Glass, 12 per cent. furniture, &c. The figures are as follows:

Glass	66 %
Furniture	12 %
Crockery and Glass Ware	23 %
Wooden Ware	68 %
Baby Carriages	14 %
Sewing Machines	37 %
Paints, Oils and Varnishes	71 %
Wagons and Carriages	32 %
Agricultural Implements	55 %
Agricultural Machinery	34 %
Paris Green	38 %
Stoves and Ranges	70 %
Plumbing, Heating, &c.	34 %
Tin Shop Work	43 %
Roofing and Cornice Work	42 %
Gas, Gasoline and Oil Stoves	65 %
Binder Twine	50 %
Clocks and Watches	21 %
Tin and Enameled Ware	74 %
House Furnishing Goods	56 %
Rope	88 %
Electrical Goods and Supplies	19 %
Lamps and Lamp Goods	36 %
Building Paper	66 %
Bicycles	37 %
Silver Ware	54 %
Field and Garden Seeds	41 %
Carpets and Oil Cloth	27 %
Wall Paper	8 %
Dairy Supplies	39 %
Sporting and Athletic Goods	57 %
Sash, Doors and Blinds	26 %
Gas Fixtures	14 %
Mill Supplies	37 %
Iron and Steel	59 %
Heavy Hardware	67 %
Photographers' Supplies	4 %
Harness and Whips	54 %
Phonographs	27 %
Stationery	10 %
Iron and Brass Bedsteads	13 %

All classes of trade, whether makers or distributers of goods in a larger or a smaller way, will certainly find this presentation of facts suggestive. There is something here for the manufacturer and jobber as indicating the growing scope of the term Hardware, while to the retail merchant there naturally comes a suggestion of the possible desirability of seeking for business in new lines. These figures emphasize the changes which are taking place in the channels through which goods find their way to the public, and will bring up the question as to the ultimate effect of all this upon trade. We simply chronicle the tendency, and leave it to our readers to draw their own conclusions.

Condition of Trade.

Trade continues to be without marked change from the conditions which have prevailed during the past month or two. Wholesale houses are generally buying for early delivery such goods simply as are needed to keep their stocks up to a working level, and are carefully canvassing the situation with a view to determining what to do about ordering for future delivery. In the present condition of the market they thus maintain a waiting attitude, and are not disposed to act hastily. The lower prices on raw material are having some effect on manufactured goods, but as a rule this is not as yet marked, and in many lines the increased cost from higher labor and growing expenses tends to keep quotations steady. Some of the manufacturers are relaxing the pressure under which they have been operating, inasmuch as the present demand is not sufficient to take up their full output. Business throughout the country is generally reported good, and the prosperity which exists should make business satisfactory during the coming months.

Chicago.

(By Telegraph.)

The situation in Builders' Hardware indicates a fair activity in building operations. One large manufacturer said that the present year would be his banner year, and that the month of October would be his best month. Others voice a more or less favorable sentiment. Shelf Hardware is moving actively, as the local Hardwareman is closer to the farmer than he is to Wall Street and shares the good fortune and enthusiasm of the prosperous farmer. Machine, Carriage and Stove Bolts are weak in price, large buyers being able to make almost their own prices. Wood Screw manufacturers are paying but little attention to the revised list, selling to all their old customers on the old list. Manufacturers of Hardware Specialties report that business is good. The hard times demand for low priced materials is conspicuous by its absence, and the better grades of goods are the best sellers.

St. Louis.

(By Telegraph.)

Busy conditions continue to rule in the Hardware market, and jobbers report a satisfactory volume of orders from their traveling forces. Dealers are looking forward to a good sale for holiday goods, and are buying quite liberally of Cutlery and other lines suitable for this class of trade. In anticipation of the colder weather soon to come the sales of Stove Pipe, Stove Boards, Coal Hods, &c., have been quite prominent.

NOTES ON PRICES.

Wire Nails.—There appears to be no disposition on the part of the trade to anticipate their wants to any great extent, actual requirements serving as a guide when placing new business. The market is well maintained, but delivered prices from some mills do not always represent full tariff rates. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$2.00
Retailers, carload lots	2.05
Retailers, less than carload lots	2.15

New York.—The local demand continues in about its

former volume, which is not great but continuous. Quotations are as follows: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

Chicago, by Telegraph.—Local jobbers have been notified of an advance for Galvanizing Wire Nails to the following prices: 2d and larger, $1 per 100 pounds; smaller sizes, $1.75; Special Galvanized Shingle, 75 cents. This is 25 cents higher than former prices. The demand is fairly active on Wire Nails. Sales are being made at $2.15 to $2.20 in carload lots, f.o.b. Chicago, the inside price to jobbers and the outside to retailers.

Pittsburgh.—Demand for Wire Nails is quite active, and the leading mills are making large shipments. Specifications on contracts are coming in at a very satisfactory rate. Prices are firm, but without change. We quote $2 in carloads to jobbers, $2.05 in carloads to retailers and $2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

Cut Nails.—The Cut Nail Association hold a meeting on Thursday of this week. It is difficult to forecast the effect on prices resulting from the meeting, as it is anticipated that there will be divergent views, both as to the desirability of reaffirming and of reducing prices. The market is generally well maintained, but in some instances shows a tendency toward weakness, which is reflected by irregularities in price. Quotations are as follows: $2.15, base, in carloads, and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

New York.—The local market shows no change in demand, this continuing of about the same volume as for some time past. Quotations for carloads and less than carloads are as follows: Carloads on dock, $2.29; less than carloads on dock, $2.33; small lots from store, $2.40.

Chicago, by Telegraph.—Business continues active, especially on the smaller sizes. Sales are being made on the basis of $2.30 in carload lots and $2.35 for less than carload lots for Steel, Chicago. Iron Nails are quiet, but the supply is only moderate and sales are made at $2.45 to $2.50 per keg from store.

Pittsburgh.—Demand for Cut Nails is restricted to carloads and small lots, buyers placing orders only for actual needs. On carload lots a slight concession in prices is being made. We quote: Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads; Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—Buyers are placing orders frequently, rather than making contracts for future delivery. The volume of business done by the mills is fairly large. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.30	$2.60
Retailers, carload lots	2.35	2.65
Retailers, less than carload lots	2.45	2.75

Chicago, by Telegraph.—Local producers and mill representatives are optimistic, both because of the current business and particularly on account of the good crops and general prosperity of Western agricultural interests. Galvanized Wire is selling on the basis of $2.75 to $2.80 in carload lots, and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Plain, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

Pittsburgh.—A moderate amount of tonnage is being placed and the mills are fairly busy. Buyers, however, continue to place orders in small lots for actual needs. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.30; Galvanized, $2.60, in carloads to jobbers; Painted, $2.35; Galvanized, $2.65, in carloads to retailers; Painted, $2.45; Galvanized, $2.75, in small lots to retailers.

Smooth Fence Wire.—The demand is from fair to active, according to location from which orders are received. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95
Less than carloads	2.05

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—Business is up to the usual standard for the season, and the outlook for spring trade is encouraging in spite of the fact that no large orders are being placed or contracts of any magnitude consummated. The market remains steady in tone without change in prices, which are as follows: Nos. 6 to 9, $2.05 to $2.10 in carload lots on track, and $2.15 to $2.20 in less than carload lots from store; Galvanized, 30 cents extra for Nos. 6 to 14, and 60 cents extra for Nos. 15 and 16.

Pittsburgh.—Demand is fair, but is nearly altogether for present requirements, the large trade declining to make contracts. We quote: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Cordage.—The Rope market appears to be in a satisfactory condition, demand being up to expectations for the season and prices fairly regular. Quotations, on the basis of 7-16-inch diameter and larger, are as follows: Pure Manila, 11½ cents; second-grade Manila, about ½ cent per pound lower; Pure Sisal, 9¼ cents; Mixed Sisal, 8¼ cents per pound.

Screen Wire Cloth.—The associated manufacturers of Screen Wire Cloth determined last week the quotations for next season's business, making the price 10 cents higher than for the past season. This advance is not a surprise to those who have been in close touch with the trade, and it is hoped that it will be accepted by the merchants as reasonable in view of all the circumstances.

Poultry Netting.—The manufacturers of Galvanized Poultry Netting on October 22 agreed upon their prices for the coming season, making them the same as those which have prevailed during the present year. There thus continues to be the usual differential of 5 per cent. between the Netting galvanized before weaving and that galvanized after weaving.

Agricultural Wrenches.—While there has been no general or open change in the price of Agricultural Wrenches, the tendency is toward somewhat lower quotations, and manufacturers are making concessions.

Copper.—The Copper market shows recessions in price in some of the manufactured articles, such as Sheets, Copper Bottoms, Pits and Flats, and Soldering Coppers, as indicated by the new prices adopted by the various manufacturers of these commodities October 22. The base price for Sheet Copper is now 18 cents, instead of 20 cents as previously. Copper Bottoms, Pits and Flats have been reduced 2 cents per pound on the base sizes, 14 ounces to lighter than 10 ounces. Soldering Coppers are now sold at a reduction of 1 cent per pound.

Springs.—The following revised quotations on Cliff's Patent Bolster, Seat and Pole Springs are announced by Meyer & Co., Auburn, N. Y., under date of October 10:

Cliff's Bolster Springs, discount	40 %
Cliff's Seat Springs, per pair	46c.
Cliff's ⅝-inch Pole Springs, per pair	$1.00
Cliff's ¾-inch Pole Springs, per pair	1.20

Glass.—The report that the rival labor organizations had matured a plan of consolidation proved premature. No official information has been obtainable, but it is understood that the meetings which have been held adjourned without any definite action being taken. If this is the case it leaves the maintaining of the signed scale of wages an unsettled question. There is a movement on foot by prominent persons in the Window Glass trade toward forming a new combine of manufacturers to absorb most of the factories in the Federation and Inde-

pendent Glass companies, with the exception of the co-operatives, and as many outside individual concerns as can be induced to come in. The Glass situation remains in as undesirable a condition as ever, as far as the future outlook is concerned. Under these conditions it would seem that no quotations, however low, should be a sufficient inducement to place orders for Glass beyond immediate requirements. The introduction of the list of October 1, 1903, has complicated matters, as in addition to the new list and the one of December 16, 1902, some manufacturers are quoting the large trade from the manufacturers' list of January 1, 1901. The following discounts are being made: List October 1, 1903, 90 and 10 to 90 and 15 per cent.; list December 16, 1902, 90 and 20 to 90 and 25 per cent.; list January 1, 1901, 89 to 90 per cent.

Oils.—*Linseed Oil.*—There has been a marked decline in the price of flax seed during the week, which is in line with the anticipations of the trade. This has confirmed buyers in the belief that purchasing in small quantities for the present is the best policy. City Raw is quoted at 39 cents in five-barrel lots and at 40 cents in less quantities. Out of town Raw is quoted at 35 to 36 cents, according to quantity.

Spirits Turpentine.—Demand has continued light at this point. It is reported that freight room on vessels is scarce, owing to the larger shipment of cotton; also that the freight handlers' strike may prevent the movement of Turpentine from Savannah unless the strike is soon settled. Stocks at this point are light, and the market firm at the following quotations: Oil barrels, 59½ to 60 cents; machine barrels, 60 to 60½ cents per barrel.

THE ATLANTIC CITY CONVENTIONS.

THE programme for the joint annual meeting of the American Hardware Manufacturers' Association and the National Hardware Association in Atlantic City next month has been determined upon. The National Hardware Association will begin their labors on Wednesday morning, November 18, while the manufacturers will get down to business in the afternoon. During the meetings the following addresses will be made:

"What Are We Here For?" by William M. Pratt, Greenfield, Mass.

"Transportation," by Hon. D. H. Goodell, Antrim, N. H.

"Packing Small Orders for Direct Shipment—Should an Extra Charge be Made?" by Edwin A. Walton, Cleveland, Ohio.

"The Work of the New York Postal Progress League," by James L. Cowles, secretary.

"Should Hardware Manufacturers Sell to Other Than Legitimate Hardware Jobbers?" by W. S. Wright of the Wright & Wilhelmy Company, Omaha, Neb.

Both associations will wind up their deliberations on Friday, the jobbers in the morning and the manufacturers in the afternoon, the jobbers assembling at the latter session to witness the installation of the newly elected officers of the manufacturers' organization.

The social features include a smoker on Wednesday evening, tendered by the Hotel Rudolf, the entertaining talent being furnished by the Hardware Merchants' and Manufacturers' Association of Philadelphia. The Ringgold Band of Reading, Pa., has been tendered by one of the manufacturers for use during the convention under the direction of the secretary of the National Hardware Association. This band will give a concert on Thursday evening, followed by a dance. A banquet, given by the manufacturers' association, will bring the festivities to a close on Friday evening. It will thus be noticed that the days are wholly given up to business matters, the entertainments being confined entirely to evenings. The requests already received for reservation of accommodations at the Rudolf assure, we understand, the largest attendance of manufacturers and jobbers—and their ladies—of any meeting in the history of either association. Up to the present time we are advised that almost 70 per cent. of the members of the National Hardware Association have signified their absolute intention to be present. The far West will be well represented as well as other remote sections.

Chicago Special Train.

As usual, arrangements have been made for a special train from Chicago, which will leave the Union Station at 3 p.m. November 16, reaching Atlantic City in time for dinner on the 17th. This train will consist of buffet car, two dining cars, four sleeping cars and an observation car. Members of the Western trade desiring to travel on this train should apply for sleeping car reservations to H. H. Roberts, 1205 Fisher Building, Chicago. About 70 guests have already secured reservations, and it is the hope of the committee that this number may be swelled to 100. The special train will stop at Fort Wayne, Ind.; Crestline, Ohio; Pittsburgh; Altoona, Pa.; Harrisburg, Pa., and Philadelphia, and persons wishing to join the party *en route* should communicate promptly with Mr. Roberts, stating at which point they will board the train and making necessary reservations. The success of past conventions has been largely facilitated by the good fellowship that was engendered among passengers on special trains similar to the one that is to be run from Chicago. It is important that prompt attention should be given to reservations before the lists are closed.

UNIVERSAL CASTER & FOUNDRY COMPANY.

THE interests of the Standard Caster & Wheel Company of New York City, John Toler, Sons & Co., Newark, N. J., and A. B. Diss Company, Brooklyn, N. Y., have been consolidated in a new organization, to be known as the Universal Caster & Foundry Company of New Jersey. This transaction is referred to by the company as an out and out purchase solely for the purpose of giving to the company all possible benefit of certain fundamental patents owned and controlled by each of the individual companies forming the new corporation. With these patents the new company announce that they will be in a position to make every kind, grade, size and character of Ball Bearing, Stem, Philadelphia and Metallic Bedstead Caster, and every form, style, size and kind of common and bell shaped grip necked Casters. The new company will carry out all existing contracts, and the officers of the old concerns will all be associated in such positions as will best facilitate the interests of the large body of customers which each has heretofore been serving. With a view to making goods faster, and, if possible, better, new machinery will be installed in their new factory at Newark as soon as the buildings are ready. The temporary office of the company will be at 318-326 East Twenty-third street, New York, where all correspondence should be addressed.

A. W. PIKE & CO.

SOME TIME since we published a list of San Francisco houses who are acting as the representatives of Eastern manufacturers to the trade on the Pacific Coast. To the list then given should be added the name of A. W. Pike & Co., 461 Mission street, San Francisco, who are representing a number of manufacturers in various Hardware lines. Among the accounts thus handled are those of Penn Hardware Company, Chantrell Tool Company, J. Wiss & Sons Company, J. R. Torrey & Co., J. R. Torrey Razor Company, Miller Bros. Cutlery Company, Braunsdorf-Mueller Company, Springfield Machine Screw Company, Kraeuter & Co., Wire Goods Company, Nichols Bros. and Keystone Lock Works.

AT a meeting of the directors of the American Tap & Die Company, Greenfield, Mass., held on the 21st inst., Edward Wilbur tendered his resignation as president, which was accepted, and J. Henry Nichols, who has served as director since the organization of the company, was elected as his successor, and will have charge of the sales department. It is the intention of the company to bring out a full line of Dies, which they expect to have on the market by January 1. At the present time they are producing a full line of Machinists' Hand, Machine Screw, Pulley, Taper, Machine Nut and Patch Bolt Taps.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM I. H. LOWENHAUPT & Co., who have succeeded the firm of Hubbell & Lisenby, Springfield, Mo. They will make Builders' Hardware, fine Tools and Stoves their specialties, and desire catalogues and quotations from manufacturers in these lines.

FROM WILLIAM M. LEE, who has lately opened up in the Shelf Hardware, Stove, Tinware, Agricultural Implement, Paint and Sporting Goods business at Clinton, Mass. Mr. Lee was for nearly 20 years connected with the store of C. F. Paige & Co., Athol.

FROM SYD SMITH HARDWARE COMPANY, Birmingham, Ala., who have been incorporated with a capital stock of $20,000, $15,000 paid in. The company will carry on a wholesale business in Shelf Hardware and all kinds of Building Materials.

FROM P. B. BOOKMAN & Co., who have succeeded Bookman & Craig in the wholesale and retail business in Shelf and Heavy Hardware, Agricultural Implements, Stoves, China, Crockery, &c.

FROM C. F. MORPHEW, Magnolia, Ill., who has bought the Hardware and Agricultural Implement business formerly conducted by William Brenn.

FROM HAINES & HART, Garrison, Iowa, who have succeeded Voris & Donald, dealers in Hardware, Stoves, Tinware, with Plumbing and Heating department.

FROM HORTON & SIEFKIN, who are successors to F. F. Leonard, Quimby, Iowa. The lines carried include Shelf and Heavy Hardware, Farming Implements and furniture.

FROM FOGLE & ZARUBA, who are a new firm at Diagonal, Iowa, handling Shelf and Heavy Hardware, Stoves, and Tinware and Harness.

FROM DE LOACH-MCMILLEN HARDWARE COMPANY, who have just entered business at Demopolis, Ala., as wholesalers of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Oils, Wagons and Buggies, Harness, &c. Their store, 45 x 145 feet, has been built especially for the business. Messrs. De Loach and McMillen were formerly traveling salesmen for Simmons Hardware Company.

FROM CUNNINGHAM STOVE COMPANY, who have succeeded W. A. Green in Caruthersville, Mo. Later it is intended to incorporate the business under the style of Pemiscot Hardware & Implement Company with a paid in capital of $10,000. The business will be mostly retail, but some wholesaling will be done.

FROM M. L. NOBLE, who has bought the Hardware, Stove, Paint and Sporting Goods business formerly carried on by Thomas Dickinson at Brookfield, Mo.

FROM GREENVILLE HARDWARE COMPANY, Emporia, Va., who have been incorporated, with J. B. Bailey as president and a capital of $10,000, to carry on the general hardware and grocery business.

FROM L. R. UPTON, Union, Neb., who has lately purchased the Shelf Hardware, Stove, Tinware and Wagon business formerly conducted by D. Lynn.

FROM PETERSON & HOLST of West Point, Neb., who have purchased an $8000 stock at Oakland, where they have established a branch store. They are erecting a large brick warehouse.

FROM ROOD & COOK, who have bought the General Hardware, Stove, Agricultural Implement and Wagon and Buggy business of C. K. Fisher, Fulton, Mo.

FROM BROWN & BROWN, who have acquired the Hardware, Stove, Farm Implement, Paint, Harness and Sporting Goods business of Ford & Son, Byron, O. T.

FROM FARMERS' SUPPLY COMPANY, Anita, Iowa, who have been incorporated with a capital stock of $25,000, to carry on the retail business in Hardware, Agricultural Implements and furniture. The business will be conducted on a co-operative mutual profit sharing basis. There are over 100 stockholders, 90 of whom are farmers owning one share of stock apiece, valued at $100. James E. Bruce, organizer and president and manager of the company, is president of two of the local banks.

FROM HARDWICK HARDWARE COMPANY, Hardwick, Vt., who were burned out on the 12th inst. The company have, however, resumed business on the next block to their old stand, and in addition to General Hardware and Paints and Oils intend to conduct a plumbing and heating department.

FROM MAPES-GLESS HARDWARE COMPANY, Rogers, Neb., who have been organized by Geo. E. Gless and W. E. Mapes. They intend handling everything in the Hardware line, and also a good stock of Harness.

FROM GEO. G. MCVICKER AND N. H. MAPES, who have opened a thoroughly equipped shop at Rogers, Neb., for the manufacture of Scoop End Gates, Haying Tools and other smaller articles. They will be pleased to receive circulars and quotations in regard to small Malleable Castings, Iron in Strap and Rod and Bolts.

FROM G. H. BUEKER, Chamois, Mo., who has recently completed a new store, 30 x 60 feet. Mr. Bueker is putting in a new stock of Hardware, Cutlery, Stoves, Tinware, Pumps and Wire Fencing.

FROM ALTON-DAWSON HARDWARE COMPANY, Oklahoma City, O. T., who have recently been incorporated with a capital stock of $150,000. They expect to open up for business January 1 next, handling Shelf and Heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods, Pipe and Fittings, Sheet Metal, Wagon Wood Stock, Blacksmiths' Supplies, &c. The company are intending to put seven men on the road.

FROM DUNCAN-BAKER HARDWARE COMPANY, Marion, Ill., who have been incorporated with a capital stock of $25,000, to conduct the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Paints and Oils, Sporting Goods, House Furnishings and furniture. They have also lately opened a branch store at Johnston City, and expect to open one at Herrin as soon as a location can be secured.

MUTUAL INSURANCE IN IOWA.

A. R. SALE, Mason City, Iowa, secretary of the Iowa Hardware Dealers' Mutual Insurance Association, has lately addressed a circular letter to the Hardware merchants generally of that State, inviting their attention to this association, which has been inaugurated under the auspices of the retail Hardware dealers' organization of Iowa. The association began the active work of receiving applications for insurance on July 3, and fulfilled the legal requirement of $100,000 of applications in about six weeks. On August 20 full authority was granted by the State to carry on the business of fire insurance. The association are very anxious to keep up the good record of the first two months, but at the same time desire to avoid the expensive plan of sending out a solicitor, who would probably require 25 to 30 per cent. of the premiums secured for his work. This is a saving which they are very desirous of effecting, and it is therefore hoped that the merchants of the State will continue to send in their applications voluntarily. The secretary

will cheerfully furnish any desired information in regard to this plan of insurance through which Hardware merchants are able to effect such a material saving in the cost of their insurance.

OHIO HARDWARE DEALERS' MUTUAL FIRE INSURANCE COMPANY.

THE following statement in regard to the financial status of the Ohio Hardware Dealers' Mutual Fire Insurance Company has just been issued by George M. Gray, secretary-treasurer, Coshocton, Ohio, under date October 1:

Assets.

Coshocton National	$5,907.72	
People's Banking & Trust	2,183.97	
Total cash in bank	$8,091.69	
Premiums in course of collection, not more than three months due	317.30	
Accrued interest	20.00	
Cash assets	$8,428.99	$8,428.99
Liability of members to assessment		34,199.22
Office furniture		500.00
Total assets		$43,128.21

Liabilities.

Losses unpaid	None.	
Reinsurance reserve (50 per cent. of gross premiums on risks in force)	$5,669.87	
Total liabilities	$5,669.87	$5,669.87
Surplus, including members' liability		$37,458.34
Amount of members' liabilities		34,199.22
Net cash surplus		$3,259.12
Total amount at risk		$945,710.00
Losses paid since organization		388.33

Referring to this very satisfactory showing, Mr. Gray makes the following interesting comments:

We herewith beg to inclose a statement of the Ohio Hardware Dealers' Mutual Fire Insurance Company up to the first day of this month. We wish to say in behalf of our company that if we would close up business today we could pay to our policy holders more than 70 per cent., but the directors have decided that our dividend shall be 20 per cent., as the statutes of our State require us to keep 50 per cent. of our premiums in reserve at all times.

Our statement shows that we have had less than $400 loss by fire during the past year. Our plan from the beginning has been to go on a conservative basis, hence we have not taken any risk to exceed $3000, and we much prefer to have $500 and $1000 risks. Our object in this is so that in case of disastrous conflagrations our loss *pro rata* with other companies would not affect us materially.

We have been censured by some of our Hardware friends for being too conservative, and that we do not carry enough of their insurance. At the same time, if the Hardwaremen will make a close examination, they will find that none of the large stock companies will carry over $2000 or $2500, and they all prefer to have smaller amounts than that.

We have demonstrated to the Hardwaremen that an insurance company for their benefit especially can be made a success, and that this company may grow rapidly to be a large and strong company. It certainly is the duty of every retail Hardwareman, and jobber as well, to write for an application, and we will be glad to carry all the insurance that is safe for them as well as for the company. One of our serious problems is to keep down our lines, and not take too large risks. We have between 2300 and 2400 stores in Ohio that retail Hardware, between 1300 and 1400 legitimate Hardwaremen, and there is no reason why we sould not have at least 1200 in our company. We do not solicit insurance outside of Ohio. We have some of the largest and most progressive Hardwaremen in the State in our company, and gladly welcome all such.

O. CHAN WELLS & WM. A. LOCKE, 100 William street, New York, in view of the manner in which their selling terms, "2 per cent. discount 10 days, or net 60 days," have been abused, are enclosing a card in their correspondence, saying that under no circumstances will they allow the cash discount time of their bills to date from the receipt of goods by the purchaser. In other words, invoices being dated at time of shipment, the money must be paid in ten days from that date or the discount cannot be allowed.

AMONG THE HARDWARE TRADE.

Huske Hardware House, Fayetteville, N. C., have recently taken possession of their new building, which has been erected especially for the peculiar requirements of the Hardware business. The store is 40 feet wide by 140 feet long, the basement being 40 by 53 feet. The first floor having a pitch of 17½ feet permitted the construction all around of a balcony 10 feet wide. The total floor area of the establishment is 16,600 square feet. The front of the building is of Washington pressed brick with stone trimmings. The show windows are 17 feet in hight and of one piece of plate. The building is lighted by electricity and gas, the electric lights being so arranged that the whole building may be lighted instantly, or the various departments may be lighted independently of each other. In the new building the wholesaling of goods will be taken up in connection with the former retail business. They will still continue to conduct the old store, but the new establishment will be headquarters.

T. B. Draper of Red Oak, Iowa, has bought out the Hardware store formerly conducted by Smith & Hastings at South Omaha, Neb., and will continue the business under the style of the South Omaha Hardware Company.

G. H. Busse has purchased the Hardware, Stove, Agricultural Implement and Sporting Goods business of N. J. Ashley, Decatur, Neb.

E. L. Rasberry, dealer in Hardware, Farm Implements, Vehicles, &c., Rockdale, Texas, has disposed of his business to the Coffield Hardware & Iron Company, in which he has taken an interest. The company will carry on the wholesale as well as retail business.

Bollen & Hollinger will, on January 1 next, succeed to the Hardware and Agricultural Implement business of Geo. Bollen & Son, Laurel, Neb.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers issuing new catalogues or price-lists are requested to send to THE IRON AGE *two copies—one for the Catalogue Department in the New York Office, and one for the Iron Age Library of Trade Literature in London.*

THE HOPKINS & ALLEN ARMS COMPANY, Norwich, Conn.: An attractive colored folder illustrating their line of Guns, Rifles, Revolvers, &c.

MICHIGAN BOLT & NUT COMPANY, Detroit, Mich.: Catalogue No. 10, illustrating, with price-lists, Bolts, Lag, Skein and Hanger Screws, Stove Scrapers, Plow Clamps, Rivets, Turnbuckles, Nuts, Washers, Dock and Building Material, Electrical Construction Material, &c. The company are considerably enlarging their plant, especially in equipment for the manufacture of Special Forgings, including Turnbuckles with hooks and eyes, and a large variety of other material used especially in electrical construction.

HARRINGTON & RICHARDSON ARMS COMPANY, Worcester, Mass.: Catalogue No. 7, illustrating Single Barrel Automatic Ejecting and Nonejecting Guns; also a large and varied line of Revolvers.

LANSING WHEELBARROW COMPANY, Lansing, Mich.: Catalogue No. 7 A, devoted to Wheelbarrows, Warehouse Trucks, Field Rollers, Fence Machines, Horse Pokes, Hods, Skids, Rubber Tired Wheels, Hand Carts, &c. The catalogue contains about 50 new pages, showing increased lines of Trucks, Barrows, &c., also Rubbered Wheels, Casters, &c. Additions have been made of Trucks for moving material on railroad tracks.

T. C. PROUTY COMPANY, Albion, Mich.: Hanger illustrating their offices and works, together with cuts of No. 5 Cushion Track Parlor Door Hanger and No. 2 Prouty Noiseless Parlor Door Hanger.

THE WILLIAMS PUMP COMPANY, Indianapolis, Ind.: Price-list No. 2, illustrating the Williams Gray and Malleable Iron Pumps. A feature of the Pumps is an arrangement by which all working parts can be taken out through the stock for making repairs.

A. O. NORTON, 286 Congress street, Boston, Mass.:

Illustrated catalogue devoted to Norton Patent Ball Bearing Jacks and Sure Drop Track Jacks. These are made in a variety of styles up to 60 tons capacity.

AVERY STAMPING COMPANY, Cleveland, Ohio: Circular illustrating and describing new style Plain Back Shovels and Spades, also the company's regular line of Cleveland Pattern Hollow Back Shovels, Scoops and Spades, as well as Ash Shovels and Sidewalk Cleaners.

OSGOOD SCALE COMPANY, Binghamton, N. Y.: Leaflets relating to Platform, Wagon, Counter and Family Scales. Illustrations and descriptions are given of these goods.

THE INTERNATIONAL CUTLERY COMPANY, Fremont, Ohio: Illustrated catalogue and price-list of Shears and Scissors, Tinners' Snips, Tailors' and Pruning Shears, Razors, Razor Strops, &c. Particular attention is directed to Razors, to which more than 30 pages of the catalogue are devoted.

V. CLAD & SONS, Philadelphia Pa.: Second edition of catalogue of Clad's Ice Cream Machinery, containing over 50 pages, devoted to Freezers, Ice Breakers, Cans, Tubs, Molds, &c.

THE WIRE GOODS COMPANY, Worcester, Mass.: Illustrated leaflets relating to various goods of the company's manufacture are being sent to the trade with gratifying results. These show, among other goods, Garment Hangers, of which the company make a most complete line, and of which they are making a leader at this season of the year.

NASHUA NOVELTY WORKS, Nashua, N. H.: Illustrated folder devoted to Opera and Folding Chairs, Assembly Hall, Church and Sunday School Seatings. These are made in one to six seat lengths, and finished in golden oak, red birch or natural wood. The material used is birch, maple or oak. The folder shows 17 styles of Chairs and Seatings.

JOHN PENDER & Co., Brunswick, Victoria (a suburb of Melbourne), Australia: Thirty-two-page pamphlet catalogue, illustrated, of Horseshoe Nails and Rasps, this concern having made Horseshoe Nails for 20 years.

THE NEW DEPARTURE MFG. COMPANY, Bristol, Conn.; John H. Graham & Co., 113 Chambers street, New York: New illustrated catalogue of Bicycle and Door Bells, Car, Fire, Call, Tea and Office Bells, Cyclometers, Cycle Lamps, Coaster Brakes and a general line of Cycle Sundries. The New Departure Lubricant, made especially for use in all forms of Coaster Brakes, with a minimum melting point of 356 degrees F., is now put up in ½-ounce as well as 2-ounce collapsible tube sizes.

ASSIGNMENT OF SMITH, LYON & FIELD.

SMITH, LYON & FIELD, 139 Duane street, New York, jobbers of Hardware, made an assignment to Percival C. Smith, a brother of the senior partner, October 26. The announcement occasioned much surprise in the trade and much sympathy is expressed with the members of the firm, who are highly esteemed. The assignment is absolutely without preference and for the equal benefit of all creditors. The members of the firm will devote their entire time and energy to assisting the assignee in realizing the greatest possible return from the assets.

MARKETING GOODS SUCCESSFULLY.

JOHN LUCAS & CO., Philadelphia, Pa., well-known Paint manufacturers, some time since placed on the market a Varnish and Paint Remover. The article was introduced to the trade on its merits in an up to date and aggressive manner, and they now report receiving large orders for it from all parts of the country. Moralizing on this the company remark that there are many to-day in business who are quick to complain of the keen competition in all lines, regarding the times as not what they used to be, and finding it difficult to take a glowing view of modern business conditions. There are, however, two sides to the question. Let a manufacturer to-day make an up to date article, possessing merit, and introduce it right, and he will find a lively sale awaiting it. Under modern conditions the opportunities for the successful introduction and sale of meritorious goods have been increased many fold.

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NATIONAL ASSOCIATION OF AGRICULTURAL IMPLEMENT AND VEHICLE MANUFACTURERS.

THE tenth annual convention of the National Association of Agricultural Implement and Vehicle Manufacturers was held in Cleveland last week at the Hollenden. President Martin Kingman called the convention to order, and then delivered his annual address, in which he reviewed the work of the association during the year and touched on a number of topics of special interest, including the labor problem, trusts, bankruptcy law, reciprocity and foreign markets. Following the president's address, F. E. Myers of F. E. Myers & Bro., Ashland, Ohio, presented the report of the Executive Committee, of which he was chairman. This interesting report was given in our last issue. The reports of the secretary and treasurer were then presented.

The first business of the second session was the reading of the report of the association's attorneys, Bulkley, Gray & More of Chicago, which was read by Mr. More. The report of the Committee on Passenger Transportation followed, read by H. C. Stover.

Parcels Post Bill.

Chairman James Deering's report as chairman of the Committee on National Legislation was then read. The association again put itself on record as opposed to the Parcels Post bill in the following terms:

It will be remembered by the members of the convention that in 1902 it was decided by your Executive Committee that the institution of a system maintained by the Government by which parcels might be shipped by mail from one part of the country to another under conditions and terms similar to those under which most of the important foreign governments maintain such a system would be against the interests of the Agricultural Implement and Vehicle trade. It only remains, therefore, for your Committee on National Legislation to record again the sentiment of the Executive Committee on this question.

Reports were then presented from the committees on State Legislation, Fairs and Expositions, Foreign Commerce, Revision of Constitution and By-Laws and Patents.

Patents.

The report of the Committee on Patents was presented by P. A. Myers, chairman, Ashland, Ohio. After stating that the purpose of this committee was to keep a watchful eye on all proposed patent and trade-mark legislation by the National Congress Mr. Myers said that the report would deal with the following matters, which would be treated in that order:

1. The trend of recent Federal decisions as to the power and right of patentees to regulate prices and terms of sale imposed by their licensees in selling the licensed articles to the general trade.
2. Legislation looking to making the decision on patent in one circuit good and effective in other circuits, so that a patentee, having won a case in one part of the country, could feel sure of succeeding in another part, to the same extent that he could succeed a second time in the place or circuit where he obtained his first favorable decision.
3. As to granting preliminary injunctions in cases where the patent involved has been but recently issued by the Government, and, therefore, has not been either sustained after a regular trial or had its validity acquiesced in by that part of the general public adversely interested, there not having been time since its issue for such adjudication or acquiescence to take place.
4. As to obtaining extensions of patents hereafter.
5. The present practice of the United States Patent Office in requiring an application for a patent to be divided into two or more separate applications or divisions whenever one or more parts of the claimed invention may be used without necessarily including the others in the same machine or structure.
6. The present legal inability of one or more joint inventors of an invention to file an application for a patent unless and until all such joint inventors join in executing the application.

The report was an admirable one, covering as it did the different phases of the subject in a very complete and comprehensive manner.

Membership.

At the third session S. B. Lafferty of the Red Jacket Mfg. Company, Davenport, Iowa, presented the report of the Membership Committee. It showed that the association had gained during the past year 19 active and eight associate members, and had lost ten active and four associate members, the present membership being 326 active and 131 associate, showing a net gain of 13.

Reports followed from the committees on Arid Lands and Irrigation, Credits, Attorneys and Litigation and freight transportation.

Change in Dues.

At the fourth session the convention took up the resolution proposing amendments to the by-laws, reducing the dues of companies with less than $50,000 capital to $5. An amendment was offered proposing a graduated scale of membership dues, ranging from $10 to $35. This amendment was adopted, and the original motion as amended was carried. On motion the rate for companies with capital under $50,000 was specially reduced to $5 for the next six months.

Resolutions.

The report of the Committee on Dealers' Associations followed, read by Chairman W. S. Thomas. The report of the Committee on Resolutions, in addition to expressing thanks for hospitality, and to the officers and chairmen of the committees for the services rendered the association, expressed the judgment of the association on the following subjects: In favor of the appointment of a permanent non-partisan tariff commission, consisting of business men; in favor of the Lodge bill, providing for a thorough reorganization for the consular service; commending the recommendations of the President in regard to forestry and irrigation; in favor of legislation for improvement to public roads; and recommending action looking to a more correct classification of Implement and Vehicle dealers by the mercantile agencies.

Election of Officers.

The following officials were chosen for the ensuing year:

PRESIDENT: F. E. Myers of F. E. Myers & Bro., Ashland, Ohio.

VICE-PRESIDENTS: F. S. Fish of Studebaker Bros. Mfg. Company, South Bend, Ind.; H. R. Stoepel of Gale Mfg. Company, Albion, Mich.: Danforth Geer of Walter A. Wood Mowing & Reaping Machine Company, Hoosick Falls, N. Y.; C. H. Adams of Marseilles Mfg. Company, Marseilles, Ill.; H. M. Wallis of J. I. Case Plow Works, Racine, Wis.; E. P. Curtis of Richardson Mfg. Company, Worcester, Mass.; J. W. Bettendorf of Bettendorf Axle Company, Davenport, Iowa; O. V. Dodge of Kansas City Hay Press Company, Kansas City, Mo.; W. B. Hardy of Brinly-Hardy Company, Louisville, Ky.; Frank C. Johnson of American Seeding Machine Company, Springfield, Ohio; R. S. Buch of A. Buch's Sons, Elizabethtown, Pa.; H. A. Avery of Avery Stamping Company, Cleveland, Ohio.

TREASURER: Walter A. Rosenfield of Moline Wagon Company, Moline, Ill.

EXECUTIVE COMMITTEE: W. W. Collier, chairman, of American Harrow Company, Detroit, Mich. Members of committee for three years: H. M. Kinney of Winona Wagon Company, Winona, Minn.; C. G. Rowley of Aspinwall Mfg. Company, Jackson, Mich.; F. E. Swayne of Robinson & Co., Richmond, Ind.

Chattanooga, Tenn., was selected as the place of meeting next year.

IRON AND HARDWARE MERCANTILE AGENCY.

THE IRON AND HARDWARE MERCANTILE AGENCY, 320 Broadway, New York, with branch offices in Boston, Cincinnati and Cleveland, have just issued the Blue Book of Credits of the Hardware, Iron, Metal and Machinery Trades. This is a book of credit ratings containing about 400,000 rated names of wholesalers, retailers and manufacturers, and aims to cover the trades to which it relates very completely. The information in this book of reference is confined exclusively to Hardware, Iron, Metals, Machinery, Foundries, Railway and Electrical Supplies, Electric Power Plants, Machinists, Engine and Boiler Makers, Plumbers, Steam and Hot Water Heating, Blacksmiths, Wagons and Carriages, Agricultural Implements, Sporting Goods, Stoves, Tin and House Furnishing Goods, Mill Supplies and manufacturing plants of every kind of this character who buy direct from the trade. The Blue Book is issued in March and September of each year.

FACTORY COST AND BUSINESS METHODS.

SELF PROVING COST SYSTEM OF BRIDGEPORT BRASS COMPANY.

First Article.

BY GUY P. MILLER.

THE Bridgeport Brass Company, Bridgeport, Conn., a corporation employing over 1000 people, are engaged in the manufacture of brass, copper, bronze and German silver, in the form of Sheets, Wire, Rods and Tubing, both brazed and seamless. These materials are made in what are termed Raw Material Departments. The "cutting up," or what are termed the Manufacturing Departments, use a portion of the product of the Raw Material Departments for manufacturing specialties as well as standard goods, such as Bicycle Pumps, Search Light Lanterns, Plumbers' Torches, Lamps, Burners, Gongs, &c. It is the system in use in the Manufacturing Department which is described in detail in the following articles.

FACTORY ORGANIZATION.

Before explaining the details of the cost system a general description of the company's organization is given in order that what follows may be more easily understood.

The Organization Diagram, Fig. 1, was arranged with the idea of setting forth the various departments in their relations to each other, so that the responsibilities of each department should be clearly defined and that no department should assume duties which belonged to another. As shown in the diagram, the directors and the general manager are the responsible heads. Responsible to them is a body called the Executive Committee, composed of the Manager of the Selling Department, the Manager of the Office Force, the General Superintendent of Plant and the Superintendent of the Metallurgical Department. These four members have responsible to them all departments of the business, each of which departments has a head or foreman.

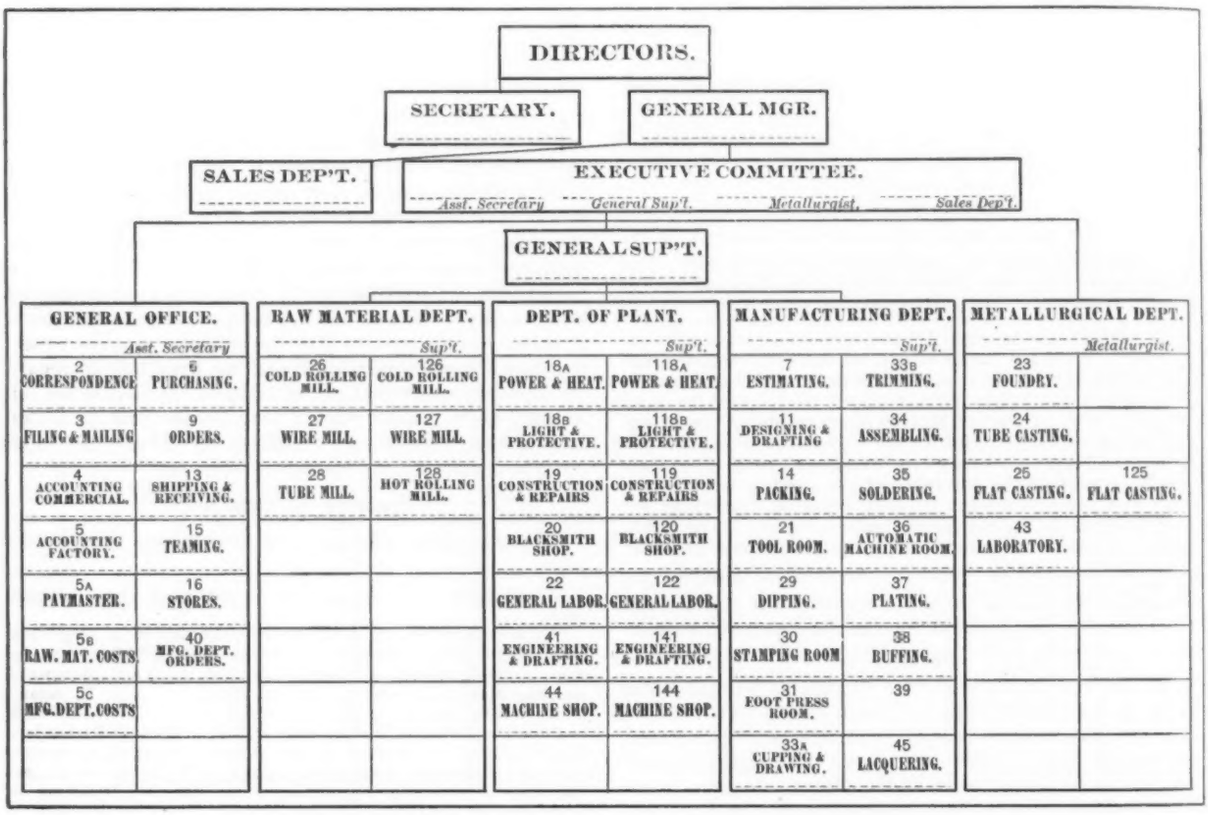


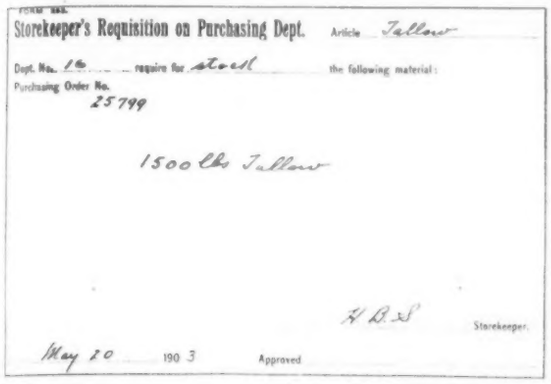
Fig. 1.—Diagram Showing the Business Organization of the Factory, with Names of Officers, &c.

All Clerical Departments, including Correspondence, Filing and Mailing, Commercial Acounting, Factory Accounting, Purchasing, Order, Shipping and Receiving, and Stores, are responsible to the Office Manager. All Metallurgical Departments, including the Laboratory and Casting Departments, are responsible to the Superintendent

1903		Tallow				Hunt #5							
Date	Rec'd	Cost	Del'd	Bal	Piece	Value	From	Left 27	Left 28				
5/1				1166	.08	93.28	Roll Room						
5/2	150	12.00		1316	"	105.28	"						
5/3	374	29.92	374	1316	"	105.28	"		29.92				
5/5	391	31.28	391	1316	"	105.28	"		31.28				
5/5	158	12.64		1474	"	117.92	"						
5/22	391	31.28	391	1474	"	117.92			31.28				
5/22	130	10.40		1604	"	128.32	"						
5/29	397	41.76	397	1604	"	128.32	"		41.76				
5/29	150	12.00		1754	"	140.32	"						
5/29			639	1098	"	8160	"	4784					

Fig. 2.—Stores Ledger, Showing Receipts and Deliveries. Size of Card, 5 by 8 Inches.

of Metallurgy. All Raw Material Departments, including rolling mills, Wire mills and Tube mills, are responsible to the Superintendent of Raw Material Departments. All Manufacturing Departments are responsible to the Superintendent of those departments, and all Power and General Expense Departments to the Superintendent of Plant. The


Storekeeper's Requisition on Purchasing Dept. Article Tallow

Dept. No. 16 require for stock the following material:

Purchasing Order No. 25799

1500 lbs Tallow

H B S Storekeeper.

May 20 1903 Approved

Fig. 3.—Storekeeper's Requisition on Purchasing Department. Size of Slip, 4 by 6 Inches.

Superintendents of Raw Material Departments, of Manufacturing Departments and of Plant are responsible, in turn, to the General Superintendent.

MANUFACTURING DEPARTMENT.

The name of each department indicates the special kind of work performed in that department. For example, the chart shows that Department 34, a Manufacturing Department, does "assembling." This is the last department through which manufactured goods go before being shipped. In this department various parts of an article are put together, or "assembled," to make the completed article.

It can be readily seen that the Organization Diagram is of great assistance to a new employee, especially if he occupies an important position, as he can more quickly comprehend the scheme of organization and the relations of departments to each other.

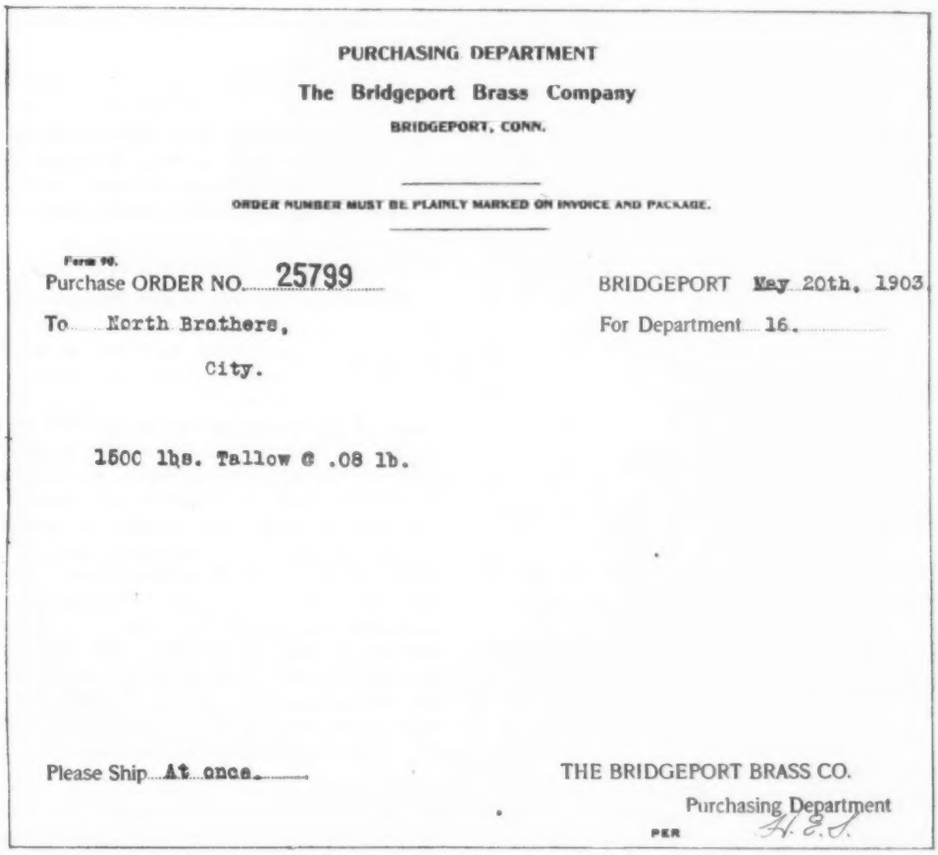
DESCRIPTION OF COST SYSTEM.

"Does it check?" or "What is the proof of the correctness of these figures?" is the first thought which comes to the manager's mind when he has placed before him a compilation of facts, on the accuracy of which he must depend in determining, possibly, a policy of conducting a very important department of his business.

PERPETUAL INVENTORY.

The cost system in use by the Bridgeport Brass Company has been worked out with the idea that the system which does not prove itself correct is misleading and, therefore, worse than useless. The key to a cost system is the perpetual inventory record. Provided this is so accurate that it can be better depended upon than an actual inventory, the remainder of the cost work is comparatively simple. To insure an accurate perpetual inventory the manufacturer must be absolutely certain that every item of expense gets into his costs, and the system must provide for fluctuations in the prices of material and supplies. The perpetual inventory of each department will then represent the cost of the latest receipts of that department, including labor, and factory expense expended.

By the value of the latest receipts it is meant that theoretically the material in the inventory is made up of the latest purchases, so that if the monthly costs are charged with the material which has been on hand the longest, the inventory account will represent more nearly market values than it would if, in making up costs, an average cost of all material on hand were used.


PURCHASING DEPARTMENT

The Bridgeport Brass Company

BRIDGEPORT, CONN.

ORDER NUMBER MUST BE PLAINLY MARKED ON INVOICE AND PACKAGE.

Form 90.

Purchase ORDER NO. 25799 BRIDGEPORT May 20th, 1903

To North Brothers, For Department 16.

City.

1500 lbs. Tallow @ .08 lb.

Please Ship At once. THE BRIDGEPORT BRASS CO.

Purchasing Department

PER H. C. J.

Fig. 4.—Form of Order Issued by Purchasing Department. Size of Sheet, 7 by 7½ Inches.

DESCRIPTION OF STORES DEPARTMENT.

For the sake of convenience it is best to divide a perpetual inventory account on the Private Ledger into three accounts—viz., RAW STORES, STOCK IN PROCESS and FINISHED STOCK. RAW STORES represents the cost of ma

terial and supplies in the form purchased; STOCK IN PROCESS represents the cost of material and supplies in process of manufacture, on which labor has been performed, including the cost of labor; FINISHED STOCK represents the cost of completed goods ready for shipment.

RAW STORES ACCOUNT.

Raw Stores account is debited with receipts from venders of material and supplies and credited monthly with deliveries as reported by the Stores Department. The balance of this account on the first of any month should equal the total of the balance of itemized accounts on the Raw Stores Ledger. The total debits to Raw Stores account on the Private Ledger are balanced monthly with the total debits to the Stores Ledger in the Stores Department, and the credits to the Stores Ledger are balanced with the debits to order numbers in the Factory Accounting Department. If these checks are made, there can be no doubt as to the accuracy of the clerical work and no dishonest practices without collusion of a number of people, which would be unlikely. In order to have these accounts check it is necessary to have charges correspond by months. For instance, all material received in July should be debited to July accounts, without regard to the date of invoice, otherwise a liability would be created while the material was *en route* if the invoice was entered before the material was received, or, on the other hand, an asset would be shown without a corresponding liability if, for example, material billed July 1 arrived June 30 and was debited to Raw Stores account under date of June 30, while Accounts Payable account was increased a corresponding amount under date of July 1.

Outside of the necessity of a Stores Department from an accounting standpoint, it is economical, first, because it has a place for everything and everything is kept in its place; second, because maximum and minimum quantities of each kind of material to be carried in stock can be intelligently established, to the end that the least necessary investment may yield the largest return; and, third, that time of valuable men may not be lost in searching for material or supplies with the consequent annoyance, when the stock has been exhausted without more being ordered in time to prevent a costly delay.

Form 90.

Purchase ORDER NO. 25799 BRIDGEPORT May 20, 1903.

To North Brothers. For Department 16

City. Stand. Ord. Plant Ord. Prod. Ord. "Stock."

1500 lbs. Tallow at .08 lb.

Duplicate.

5/22 - 391 lbs. .. .. = $31.28
" - 130 " .. .. = 10.40
5/29 397 " .. .. = 31.76
" 150 " .. .. = 12.00

Total Amount of Bill

Please Ship At once.

Received via Team Charges —

THE BRIDGEPORT BRASS CO.
Purchasing Department
PER

Fig. 5.—Duplicate of Order from Purchasing Department, Filed Under "Unfilled Orders," Showing Subsequent Entries of Material Received. Size of Sheet, 5 by 7½ Inches.

Required for Stock | Department 13 | Foreman | Date 5/22 1903

Quantity: 391 lb | Article: Tallow

On Purc. Order 25799 | Vendor North Bros.

Received by Lapp 16 R H B.

Only one item on a Card. MATERIAL REC'D CARD.

Fig. 6.—Material Received Card, Made Out by Receiving Department, Corresponding Entry Being Made on Duplicate and Triplicate Purchase Orders, Figs. 5 and 7. Size of Slip, 4 by 6 Inches.

STORES, RECEIVING, AND PURCHASING DEPARTMENTS

The STORES, RECEIVING, and PURCHASING DEPARTMENTS bear such close relations to each other that the system in use in all can be best described at one time.

The Stores Ledger is a card ledger of accounts carried with each kind of material carried in stock. On account of the large variety of articles carried in stock, which are used by numerous departments, the headings on the cards differ considerably, so these are written in as desired when the accounts are started, the cards being specially ruled. Fig. 2 shows an account with tallow for one month. The maximum quantity of this material to be kept in stock is thus shown to be 2400 pounds, and the minimum quantity 1250 pounds. As receipts or deliveries are posted the balance is changed instead of writing up balances monthly. The attention of the posting clerk is thus called at once to balances which are below the minimum quantities decided upon to be kept in stock, and requisitions to replenish the stock are made out on the Purchasing Department.

FORM OF REQUISITION.

This Requisition, Fig. 3, is made in duplicate, the duplicate being filed in the Stores Department in a tray containing unfilled requisitions until the material ordered is received, when the requisition is transferred from the "Unfilled" to the "Filled" box. On receipt of the requisition from the Stores Department the Purchasing Department makes an order to the vender, which is made out in triplicate on the typewriter, and files the Stores Requisition. The original Purchase Order, Fig. 4, is sent to the vender, the duplicate, Fig. 5, is filed in the Purchasing Department under the heading "Unfilled Or-

ders," and the triplicate, which is an exact carbon copy of the duplicate, is sent to the Receiving Department as a notification that the material has been ordered, and may be expected to arrive in due season.

MATERIAL RECEIVED CREDIT.

On receipt of a portion of the material ordered the Receiving Department makes out a Material Received Card, Fig. 6, in duplicate, records the receipt of the material on the triplicate Purchase Order, Fig. 7, and also records the receipt on a Partial Receipt Order, Fig. 8, which is returned to the Purchasing Department. The triplicate Purchase Order is not returned until the order is filled. The original Material Received Card, Fig. 6, is sent to the Stores Department, where it is finally filed with the duplicate Requisition, Fig. 3. The duplicate

Form 90.

Purchase ORDER NO. 25799 BRIDGEPORT May 20th, 1903.

To North Brothers. For Department 16

City. Stand. Ord. Plant Ord. Prod. Ord.

"Stock."

1500 lbs. Tallow at .08 lb.

Triplicate.

5/22 391 lbs
" 130 "
5/29 397 "
" 150 "

Total Amount of Bill

Please Ship At once THE BRIDGEPORT BRASS CO.

Received via Charges ✓✓ Purchasing Department

PER H E J

Fig. 7.—Manner in Which Goods Received Are Entered on Triplicate Purchase Order. Size of Sheet, 5 by 7½ Inches.

price and extension, and also records the receipt, price and extension on the duplicate Purchase Order. The Partial Receipt is then sent to the Stores Department, where it becomes the voucher from which is posted the debit to the Stores Ledger. When the last shipment on the order is received the duplicate Purchase Order is sent to the Stores Department by the Purchasing Department and the triplicate filed in the Filler "Order" box.

MATERIAL DELIVERED.

Postings of deliveries from Stores Department are made from Material Delivered Cards, Fig. 9, which are made out by the foreman of the department requisitioning the material, who fills in the order number, date and material desired and forwards to the Stores Department. The weight of material delivered is recorded on the card

FORM 122.

Purchase ORDER NO. 25799 Partial Receipt.

BRIDGEPORT 5/22/03

From North Bros. City

391 lbs tallow @ .08 = $31.28

Received Via Team

Charges ✓✓

Fig. 8.—Partial Order Receipt Sent to Purchasing Department. Size of Sheet, 5 by 8 Inches.

Material Received Card is filed in the Receiving Department, all cards of the same date being filed together alphabetically.

PARTIAL RECEIPTS.

On receipt of the Partial Receipt, Fig. 8, the Purchasing Department records thereon from the vender's bill the

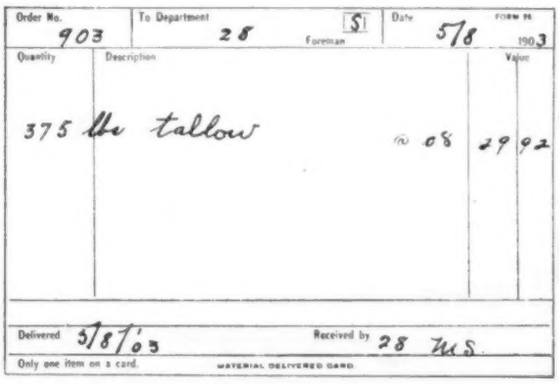
by the clerk in the Stores Department, who returns the card with the material to the foreman. He receipts for the material, and writes in the date of receipt and returns the card to the Stores Department. It is there priced, extended and posted to the Stores Ledger, after which it is sent to the Factory Accounting Department to be charged to the proper order number.

STOCK IN PROCESS.

The Stock in Process account on the Private Ledger is debited monthly with deliveries of material and supplies made during the month by the Stores Department to productive and nonproductive departments, and with the pay roll for the month, including direct and indirect labor. It is credited monthly with total cost of deliveries made during the month to Finished Stock and to customers, this cost being composed of material, labor direct and indirect, and supplies. The balance of Stock in Process account therefore represents the value of material in process of manufacture, including cost of material, labor and supplies.

FINISHED STOCK.

Finished Stock account is debited monthly with the cost of deliveries of finished goods to the Finished Stores Department and to customers. Although a large portion of material manufactured is made on orders and shipped immediately on completion, this material theoretically


Order No. 903 | To Department 28 | Foreman [S] | Date 5/8 1903

Quantity	Description	Value	
375 lbs	tallow	@ 08	29 92

Delivered 5/8/03 Received by 28 MS

Only one item on a card. MATERIAL DELIVERED CARD

Fig. 9.—Material Delivered Card, Covering Deliveries by Stores Department, Made Out by Foreman of Department Requisitioning the Material and Filled in by Stores Department. Size of Slip, 4 by 6 Inches.

passes through the Finished Stores Department, shipments to customers direct being both debited and credited to this account in the same month. The account is credited with cost of deliveries to customers only, the balance therefore representing the cost of Finished Stock on hand at the close of the month.

Subsequent articles will describe in detail the company's method of ascertaining and recording costs and other particulars in connection with their factory management.

USEFULNESS OF ACCURATE COST SYSTEM IN CASE OF FIRE.

An adequate cost system sometimes has advantages which were not taken into account when the system was inaugurated. Such an instance recently was that of the Bridgeport Hardware Mfg. Company of Bridgeport, Conn. The company's factory was destroyed by fire, being a total loss—stock, machinery and building—only the books being saved. An inventory had been taken July 1. Taking that as a basis, the application of the cost system gave to the company very close to the actual loss, reckoned by the same system with which they found exact cost of goods. There were additions, of course, for stock purchased between the time of the inventory and the fire, and here again the cost system rendered its invaluable assistance in demonstrating what the company were entitled to at the hands of the insurance companies.

NEW BRITAIN, CONN., has so many concerns which have been named after the city that the New Britain Hardware Company, dealers in Hardware, Agricultural Implements, Stoves, Furnaces, Mill Supplies, &c., have changed their style to the Barnes Hardware Company. L. M. Barnes is president and treasurer of the company, and H. W. Simonds, secretary.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., October 17, 1903.

The Week's Hardware Trade.

THE official returns as to the state of employment point clearly enough to a distinct slackening in trade. I have more than once remarked upon the value of these returns as sure indications of the state of trade. The official returns for the month of September may be briefly condensed as follows:

At Birmingham employment is moderate in the Nut and Bolt trade, quiet on machine made Rivets and Cut and Wire Nails. Spike and Rivet makers at Hales Owen are slack. Employment generally is slack in the Staffordshire Tube trade, but is fairly good on solid drawn Copper and Brass Tubes at Birmingham. Chain makers and strikers at Winlaton and Block Chain makers at Cradley report employment as fair. Other branches of the Chain trade at Cradley are slack, as are also Anchor smiths, Vise makers at Dudley, and Bit and Stirrup workers and Buckle, Chain and Cart Gear makers at Wolverhampton. In the Spring trade at West Bromwich employment is fairly good. At Wednesbury it is fair with workers on railway coach and wagon iron work, but slack on iron and steel Forgings, Railway Axles and Springs. In the Lock, Latch and Key trade employment is fairly good. In the Hollowware trade employment is bad, with short time at West Bromwich and Wolverhampton, and only moderate at Birmingham. In the wrought iron and steel Hinge trade at Birmingham it is good. In the Wolverhampton district employment is good with makers of Vermin Traps, Hoes, malleable and electrical castings, Boot Protectors and Spectacle Frames; bad with Spade finishers and Fork drawers. File cutters report employment as fairly good at Birmingham; File smiths fair at Wolverhampton. In the Edge Tool trade employment is good at Wednesbury. Employment in Stoves, Grates, &c., is fair at Birmingham, Leicester and Nottingham. Sheet metal employment is slack in the Wolverhampton district. At Birmingham it is moderate with tin plate workers, quiet but improving with iron plate workers. At Redditch employment is quiet in the Needle trade, good in the Fish Hook trade.

Apart from these official returns, demand runs mainly upon heating and lighting appliances, cooking utensils, hollowware, brass foundry and electroplated goods. Locksmiths are busy, though the building trade is only of moderate proportions, and the makers of cast, stamped and pressed Hinges, both of iron and brass, are well employed on home and foreign orders. This activity is doubtless due to some extent to the leeway to be made up in consequence of the recent strike. Steam and water fittings and plumbers' goods are, of course, at this time of the year in good request. There is also a growing demand for flushing cisterns and baths, lavatories and sanitary fittings of various kinds, chiefly on South African account. An interesting movement is the revival in the demand for hand wrought frost Nails. This in its turn has brought about a strike among work people, who ask for a return to the higher scale paid last winter. The employers declare that they can give no raise in wages in view of the present state of trade. There is steady employment in the Cut Nail branch, but the Wire Nail industry suffers keenly in competition with Belgium and Germany.

In Sheffield, merchants who have to do with the supplying of ivory, stag, pearl and other material required for hafting purposes are complaining that business is very quiet, and in many respects is below the average. Since the quarter turned orders for ivory have been given out rather more freely, but the experience of most cutlers is that the present demand is not what might be reasonably expected, and leads to the assumption that there is a quiet period in prospect. In the ivory trade there is a good deal of resentment at the way in which the various Government departments cut down prices. They are declared to be the keenest buyers that come into the market, and in connection with recent tenders invited for Ivory

cutlery the price offered was so low that the ivory cutters refused to quote.

The Proof Testing Problem in the Gun Trade.

I make no apology for returning again to the vexed question of proof testing, inasmuch as American Guns are now being sold over here in increasing quantities, and it is necessary that those concerned should be kept *au courant* with the controversy. The secretary of the employees last Saturday forwarded a letter to the Board of Trade and to the Secretary of State for War, in which he says, *inter alia:*

It is of the utmost importance to British Gun Barrel and Small Arms manufacturers, and especially to their employees, that the fullest advantage allowed by the Merchandise Marks act be taken to prevent the continuance of this pernicious competition. The root of the mischief is the present practice on the part of the English proof authorities, foreign Barrels and Small Arms, whether bearing indication of foreign manufacture or not, being proof marked precisely similar to those of British make. Without the assistance which this practice affords, such misrepresentation could not possibly take place.

Proof marking in this country is not desired on account of the superiority of English proof tests, these being practically identical with foreign proof tests—*e.g.*, Liege proof tests—the English proof marks being required only for the purpose of misrepresenting the country of manufacture. It is contended that, such being the case and these facts being well known to all concerned, and to the proof authorities in particular, many of the guardians of the proof house profiting by the practice at the expense of the purchasers of Guns, Rifles, &c., and to the disadvantage of their competitors who have sunk large sums of money in manufacturing plant and various other means for keeping the manufacturing Gun trade in this country, this practice on the part of the proof authorities is a contravention of the Merchandise Marks act, constituting a false trade description under section 3 of that act, which section explains that the expression "trade description" means any description, statement or other indication, direct or indirect, (b) "as to the place or country in which any goods were made or produced, and the use of any figure, word or mark which, according to the custom of the trade, is commonly taken to be an indication of any of the above matter, shall be deemed to be a trade description within the meaning of the act."

It is also contended that section 11 renders liable to conviction any person ordering Barrels and Small Arms, or part of a Small Arm, abroad, to be marked with any brand or mark indicating, directly or indirectly, manufactured in Great Britain, whether such goods were intended for exportation to Great Britain, or any British possession, or foreign country, or for sale in the country of manufacture. The Board of Trade has already stated that it is illegal to put upon a foreign made Barrel a brand, &c., indicating manufacture in Great Britain, even after that Barrel shall have been proved and proof marked in this country. . . .

The proof marks are relied upon in many instances by customs officers in the colonies, &c., for the purpose of determining whether or not arms imported into the colonies, &c., are of British make, and therefore entitled to preferential treatment. Besides the differential proof marking of foreign Barrels and Small Arms, it is highly desirable that the proof marks for British made Barrels and Arms should be self explanatory, easily discernible as the English proof marks by buyers and customs officers in all parts of the world, and distinctively British.

Upon the settlement of this question depends the future of the manufacture of Sporting Guns in this country. If the Government decide that the proof houses, which are under their control, shall proof mark in accordance with intention of the Merchandise Marks act, then the requisite protection of employer and workmen from one of the most insidious forms of the utilization of cheap Continental labor in competition with them both will be reduced to the minimum. Increased demand for British made arms at home and abroad will inevitably follow, and this increased demand will naturally induce the employers to put more capital into their business, to bring their plant for the manufacture of Barrels and Guns up to the highest state of perfection, and place thereby the trade in an increasingly powerful position both as regards quality and value for money. Under the conditions now prevailing capital hesitates, and neither employer nor workmen "knows where he is."

It may be well to put on record the resolutions passed by the guardians of the Birmingham proof house on October 2:

(62) Every Small Arm of foreign manufacture, and every Barrel and action of foreign manufacture, the Barrel of which respectively has been imported in a more advanced condition than that known as the "tube state," shall, when presented for definitive proof, be accompanied by a declaration in writing by the sender stating the name of the country in which it has been manufactured. If a Small Arm or Barrel and action shall be sent from a foreign country for definitive proof without having the full name and address of the maker impressed thereon, it shall be deemed to have been manufactured in the country from which it has been sent. Every such Small Arm and Barrel and action shall, after definitive proof, be impressed, near the definitive proof mark, with the words, "Foreign make," in addition to the marks applicable thereto under any of the foregoing rules.

(63) Should a Small Arm or Barrel and action be presented for definitive proof which, in the opinion of the proof master of the company to which it is presented, is subject to the provisions of the foregoing Rule 62, but is unaccompanied by a declaration as provided therein, the proof master shall require a declaration in writing from the sender showing whether such Small Arm or Barrel and action is or is not subject to the provisions of the said Rule 62. Failing such declaration, such Small Arms or Barrel and action shall be marked as provided in the said Rule 62.

The manufacturers' side of the question is stated in a letter addressed to the Secretary of State for War by Wesley, Richards & Co., whose name, of course, carries with it the greatest weight, both as to efficiency and trade influence.

The closing paragraph of their letter is as follows:

In providing rules for the prevention of the cited fraudulent use of the British proof mark, the Gunmasters consider that they have gone far enough, not only in the best interests of the trade, but also of the Gun workers.

The Production of Incandescent Mantles.

The interesting statement is made, on the authority of a manufacturer of incandescent Gas Mantles, that the annual production of these Mantles in Germany, in which country the manufacture originated, is no less than 150,000,000 (of which about 25,000,000 are exported to this country), while in the United States the production is 100,000,000, in Austria-Hungary 50,000,000, and in England and France 25,000,000. In England, however, both the home production and the home consumption are rapidly increasing.

Cash or Credit?

In the monthly report presented by the secretary to the Liverpool Ironmongers' Association there are some interesting comments as to the difficulties in the way of inducing a cash business, which are perhaps worth reproducing for the benefit of American readers:

A good deal has been said about their backwardness in that respect, and they were told that they were slow, that they had allowed the draper to get a long way in front of them, that cash sales should be encouraged, and that they were too conservative in their methods. But they knew that the manufacturer expected nowadays smart payment in place of the old system of six months' accounts, less 1½ or 2½ per cent. discount. He rendered a monthly statement and offered 5 per cent. discount if the money was paid by the 10th of the following month. That, of course, pointed to the keen competition which the manufacturer had to face, and the smaller margin of profit which compelled him to turn over his cash more quickly. As the retailers had to meet their liabilities every month, how could they afford to give to their customers 12 months', six months' or even three months' credit? Even if they were capitalists they could not do it without ultimately finding their capital eaten up by credit. They had the remedy in their own hands, and they need not be afraid of the extra bookkeeping or of the other extra work which it would entail. The system which was progressive, and which would bring them up to date, was monthly accounts for their credit trade. But they must not collect the amounts quarterly; it must be done monthly, and this would in its turn keep them acquainted with the personality of their customers. No doubt they would all be able to point to this or that customer who had always been given 12 months' credit, and who would not like to be called upon to pay monthly, but they could not stand by and fret and allow their business to decay for the sake of that individual.

American Paint in Great Britain.

W. S. Fallis, representing well-known American Paint and Varnish manufacturers, has begun on behalf of his principals to attack the European market. He reports that he has met with a gratifying measure of success, particularly in Ireland. He claims that by using prepared Paint there is much less waste, and that his company's Paints are invariably constant in their composition and possess at least 25 per cent. more covering capacity than the average Paint which is mixed by the user himself. In my opinion there cannot be any doubt that there are possibilities for American manufacturers of prepared Paints in this country. If there is one industry more than another where economy of large production operates, it is surely here. But if British trade is to be captured by American Paint manufacturers, let it be clearly understood that it can only be done on a basis of good quality. Send over cheap rubbish, and that will be an end of it.

A South African Hardware Merchant.

Robert Allan, managing director of the Hardware house of Allan & Shaw, Limited, of Capetown, is just now on a visit to this country. Mr. Allan is a recognized

authority in South Africa upon matters relating to the metal trades in that country. He was good enough to talk frankly about the situation for the benefit of *The Iron Age* readers. In response to the inquiry as to the present condition of trade out there, he said that South Africa in general would not show any great signs of commercial revival until the labor question has been settled in the Transvaal. The difficulties surrounding this problem are so many and diverse that it is not easy in a short interview to indicate them. The primary fact in Robert Allan's opinion is that the native will not work in the mines in sufficiently large numbers, and that there is at the present moment a great shortage of labor. What, then, is to be done? White labor, in his opinion, is out of the question, because it costs too much. Black labor can be got at 3 shillings 6 pence a day, but white labor at not less than 10 shillings a day. If, therefore, the black native labor will not go into the mines, and white labor is too expensive, the only alternative that Mr. Allan can see is to import Asiatic labor.

Against this there are two important objections. In the first place, it would lead to endless labor disputes, for the white men will fight the proposal to the very last ditch. Many far sighted South Africans, therefore, are of opinion that it would be unwise to precipitate a great labor dispute in these early days after the war. But objections comes from another quarter; the merchants are well acquainted with the capacity of the Asiatic for merchanting goods, and would therefore view the introduction of Asiatic labor with the utmost disfavor unless they came in by contract to do certain work and were returned home at the end of their terms. The ordinary merchant has no desire to see the Asiatic taking to commerce and underselling him in all departments. But the political constitution of the Cape, or, for that matter, the British constitution, renders anything in the nature of slavery or servitude illegal, and would be in any event repugnant to the political instincts of the people. Therefore, if great quantities of Asiatic labor are introduced into the mines, the probability is that many of them would save money even on the smallest wage, and before long would be competing with white merchants in most of the trades. Thus, on the fundamental question of labor, South Africa at the moment is at a standstill, and the effects are on all hands distinctly depressing.

In regard to credits, Mr. Allan informed me that the financial situation just now was exceedingly difficult, although he does not think it actually dangerous. It has always been the custom to give long credits in South Africa. Just now, however, money is unusually tight all round. He says that, while the financial situation is difficult, he believes absolutely in the stability of all his customers throughout South Africa.

Mr. Allan thinks that British exporters are holding their own in the Hardware trades, but he is not blind to the advance made by Americans by reason of their more pushing habits, a better system of packing, and so forth. In small Tools, for example, he says the Americans are winning, in his opinion, not so much on actual merit as because of the more attractive packing and more effective advertising. South African buyers will pay a higher price for British Brass Goods because experience has taught them that the British article is the better of the two. But in Agricultural Implements America is coming to the front. He thinks there is no prejudice against American goods, and is quite convinced that if Americans have anything worth selling they will meet with sympathetic attention in South Africa. Certainly, as far as his own firm is concerned, he is only too glad to get hold of a good marketable article, no matter from whence.

The firm of Allan & Shaw, Limited, are connected with the great Hardware house of John Shaw & Sons, Wolverhampton, Limited, who buy for them. As John Shaw & Sons at Wolverhampton have an exceedingly up to date American department, it may be assumed that Robert Allen in Capetown will not be slow in utilizing anything good which Americans can offer him.

I did not find Robert Allan particularly enthusiastic upon the question of preferential tariffs. He put it bluntly in this way: South Africans do not object, and indeed are rather favorable, to give any advantage to British houses which is possible without prejudice to themselves. But they feel themselves in the grip of the shipping rings, and their belief is that in present circumstances to give any preference to British houses merely means further to aggrandize the shipping rings. They had bought goods from New York at about half the freightage of goods from England, and until they get a free freight market he does not think South African merchants will busy themselves about any fiscal preference. For that matter, he does not think that anything substantial can be gained by tariff rearrangements, and would rather rely upon the connection between the mother country and the colonies being maintained upon lines of personal good will.

Labor and Credit in South Africa.

Two points are raised in Robert Allan's interesting comments quoted above. He speaks hopefully as to the financial stability of the retail trade in South Africa, and coming from so well informed a source, we must give it due weight. On the other hand, however, I myself know of more than one instance where South African drafts have not been taken up, and there can be no doubt that even if in the last analysis South African customers are financially firm, yet British or American exporters giving credits in South Africa must be prepared to wait a considerable length of time for their money. In regard to the labor question raised by Mr. Allan, there are, of course, two sides. The division of opinion on the labor problem has admittedly caused much bitterness. Its solution is purely a matter of time. The report of the commission appointed in the beginning of this year to inquire into the question of the introduction of Asiatic labor is awaited with some interest. Its publication is expected about the end of the present month, and until that time no indication of its contents will be allowed to leak out. Uncompromising hostility will be offered by influential political parties at the Cape to the importation of Asiatics. Many of them, including Sir J. Gordon Sprigg, believe that the labor question can be satisfactorily settled without the introduction of Chinese.

Agency in South Africa.

An interesting case has just been tried in the law courts in this country which throws a light upon the temptations to which agents are constantly subjected. A firm of Bedstead manufacturers sued a manufacturer's agent for damages for breach of an agreement to serve for six months as the firm's representative, and £30 was claimed, being money paid on account of expenses. It was alleged that the defendant fraudulently represented that he would not act as the representative of any other manufacturer, when he had, in fact, unknown to the plaintiffs, and prior to the agreement with them, verbally agreed to act as the representative in South Africa for a firm of competitors. Judgment was given for the amount claimed. I have been struck more than once with the dangers firms from a distance run in appointing agents without a full knowledge of the personality of the agent. Clearly this was a case hinging entirely upon character.

CERTIFICATES FOR CANADIAN IMPORT INVOICES.

CANADIAN importing merchants call attention to the constant annoyance and delay caused by the omission of exporters to Canada, through lack of knowledge or want of care, to properly certify the original invoice designed for the use of the Canadian customs authorities, as provided in the British Preferential Tariff and Regulations. The certificates printed herewith must be written, printed or stamped on the back of original invoices and signed, with date and address, by persons authorized to make and sign preferential certificates. The occasion for these certificates is the surtax imposed by this tariff on goods wholly or in part of German production or origin. The tariff war now existing began with the inauguration of retaliatory measures by the German Government as a protest against tariff discrimination in favor of the United Kingdom or mother country, which

Germany resents as prejudicial to her foreign trade. Below are the certificates alluded to above, both of which are necessarily a part of each original invoice:

Whereas, German goods are subject to surtax in Canada, I certify that none of the articles included in this invoice are the produce or manufacture of Germany, and that the chief value of none of said articles was produced in Germany, save and except all articles opposite which the word "Germany" is written on this invoice.

(Signature).....(Exporter.)

The following certificate is also required by law to be attached to every invoice:

This invoice is true and correct; and where there is a difference between any of the prices shown therein and the ordinary credit prices at which the same articles are now sold *bona fide* by the exporter in like quantity and condition at this place for consumption in this country, the latter prices are shown on the margin or elsewhere on such invoice.

Dated at.....18....

.....

Exporter.

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

FAVORED by genial spring weather and good spring rains throughout the States, traders are beginning to hope that the silver lining to our troubles has really come. While there has not yet been time for any actual improvement in business, still the indication of better things gives renewed heart. From every quarter come promises of a bounteous harvest. Country traders have not yet dared to stock up, and many of them are leaning heavily on their wholesale houses. It is pleasing to note there is no disposition on the part of the latter to do anything but nurse accounts. To some extent it must be said that this is only making a virtue of necessity. Shearing and Fencing lines are in most demand at present, mining and engineering requirements being still in small demand.

MELBOURNE AGRICULTURAL SHOW has just had its annual week's carnival, and has been favored with extremely good weather. This fact is worthy of comment, inasmuch as for many years past extreme ill luck in the matter of weather has been proverbial. The attendance this year has been a record one. Implement makers have done better business also. A feature of this year's show was the number of pumping plants at work (oil, steam and electrical), foreshadowing the increased attention to irrigation in Australia previously spoken of in *The Iron Age*. Some of the Reaper and Binder exhibits bore labels showing their destination to be South Africa after the show was over. The exportation of these machines to various parts of the world, including California, was referred to in a recent letter, and the trade seems to be growing. In this case the exporter is H. V. McKay of the Sunshine Harvester Works, Ballarat, Victoria, who still has some Argentine orders unfilled. Another firm, T. Robinson & Co. of Spottiswoode, Victoria, have recently been shipping extensively to South Africa such lines as Strippers and Winnowers, Rotary Disk Plows, Chaff Cutters and Harvesters.

MCLEAN BROTHERS & RIGG, LIMITED, held their ordinary general meeting at the company's offices, 279 Lonsdale street, Melbourne, a few days ago. J. M. Pratt, M.L.C., occupied the chair, and suggested that the meeting stand adjourned till September 28, in order to get in the accounts in connection with the sale of the Perth and Sydney branches. In reply to a question from a shareholder as to whether there was any likelihood of a dividend, the chairman replied that, he was sorry to say, "it is more in the other way." Meantime, it is to be noted that the Perth, Western Australia, business was sold for an amount variously reported as from £50,000 to £70,000. The Sydney stock was valued at £8270, about half of which was represented by machinery, the balance by general stock, plant and fittings.

WIRE NETTING.—Frank Butler of Lysaght Bros. & Co., Wire Netting manufacturers, of Sydney and Melbourne, giving evidence before the Iron Bonus Commission in Melbourne, stated that "you can buy Wire Nails in Germany, or take the Wire as a manufactured article at the same price. This was because the Germans get a bonus on what they send out. In Wire Netting the bonus was at the rate of 15 shillings per mile." The witness further went on to state that his firm manufactured from £120,000 to £140,000 worth of Wire Netting each year. Their trade was increasing, but profits were decreasing owing to German competition. As an instance of this competition, he stated that German makers recently took a contract from the South Australian Government at a price £3 per ton below what witness' firm could manufacture the Wire at. Witness favored a preferential duty in favor of England on this item. During the past 12 months £38,000 worth of Wire Netting was imported into this State (Victoria) alone, most of it from Germany.

FIRE ENGINES FOR BRISBANE, QUEENSLAND.—The Brisbane fire authorities are waiting to inspect a chemical fire engine shortly to be landed in Melbourne, prior to ordering themselves. Makers on your side might do far worse than mail their latest catalogues to Brisbane.

G. S. LITTLEJOHN of Scott, Henderson & Co., merchants, Sydney, has been elected president of the New South Wales Chamber of Commerce.

C. I. F.—*The Iron Age* has recently had communications on the much discussed meaning of c.i.f. with regard to the transfer of liability. The usual view of the term applies generally in the Australian trade, and that is that the seller ceases to be liable for goods shipped on c.i.f. terms upon transfer of the bill of lading and insurance policy.

VICTORIAN HARDWARE ASSISTANTS' ASSOCIATION have closed their tenth year of existence, and show a very healthy balance sheet. The association, in addition to looking to the social side of things, is instrumental in finding positions for any of its members who may be out of employment. Cozy clubrooms are provided in the center of the city, at Citizens' Buildings, Collins street, Melbourne.

COMMONWEALTH CUSTOMS DECISIONS of interest to American exporters are as follows: Chains (cistern), free; Clips (spring tie), 20 per cent.; Cylinders, wrought steel, corrugated, without ends, tubes, drilling, &c., for incorporating into boilers, 12½ per cent.; Electrical Machinery, materials, fittings, &c., strips india rubber, free; Forges, Portable "Buffalo," 12½ per cent.; Gauge Glasses, cut into lengths, but not otherwise completed, 20 per cent.; Glass, fluted sheet, 15 per cent.; Gun Fittings—viz., Wind Gauge Sights—15 per cent.; Engine Leathers for packing pistons of hot air engines, 20 per cent.; Machines and Machinery (other than Agricultural and Machine Tools)—viz., cask making machine, countershaft, drivers for trusses, setting up forms, truss hoops and trusses—12½ per cent.; Rafting Dogs, 3 shillings per hundredweight; Steel Grit, 20 per cent.; Sail or Ship Thimbles, 20 per cent.; Vine Ringers, 20 per cent.

SYDNEY.—With the close of stock taking and the beginning of a new year business seems to have brightened considerably, in addition to which a good harvest is generally anticipated, so the outlook is brighter than it has been for some months. A fair amount of building has been done, a good deal of it being of a speculative kind, and the ironmongery is therefore not as a rule of the best class. One estate has been building largely and applying a building covenant, and as a consequence using pretty good ware, so a fair business has resulted from this quarter. Two Shot towers have been erected here recently and started work, though where the business is to come from to keep them going is hard to know. The recent decision against the Customs Department *re* Shot in Cartridges will militate against their business. The refilling of Cartridges is not general among sportsmen, so therefore the makers cannot expect all this trade. A very good Shot has been turned out, and after the necessary grading, sorting and polishing had been done the result was quite satisfactory and up to standard.

CONSULAR REPORTS ON FOREIGN TRADE.

Mexico.

SOME of the essentials for building up a substantial trade in Mexico, according to one of our consuls, are a good salesman, polite, of good address, backed by a convenient stock of goods in the country, trade literature in Spanish, judicious advertising and plenty of time, it being no place for the gesticulating, rapid fire phonograph mediocre salesman. One of the best forms of advertising, however, is a display of goods, especially in Agricultural Machinery and Implements, in the larger cities. The ability to supply a broken implement or part or to send an expert to repair a machine at short notice overcomes a great objection to using such implements.

Java.

The cost of labor throughout Netherlands India is only about 10 to 20 American cents a day, which operates to restrict the use of labor saving machinery on a large scale in the agricultural districts. Certain machines, however, are used for grinding sugar cane and for hulling coffee and rice, as the work can be done much quicker than by hand. The old style native manufactured Plow, costing about $10, drawn by karbouw, is used for preparing the soil. Sowing, planting, cultivating and gathering of crops is done by hand. To increase American trade a reduction in prices is necessary. The following goods, it is said, would doubtless sell well: Axles for wagons and carriages; Carriages, if the style suits the public; Fencing Wire, Hardware, Harness, Lawn Mowers and Vehicles and Bicycles. Customs duty in the Netherlands India (Java, &c.,) is 6 per cent. ad valorem on Vehicles, including Bicycles and Automobiles; machinery free.

Brazil.

United States Consul Kenneday, at Para, Brazil, in an interesting report on "How to Build Up and Increase American Trade," after other pertinent advice, says:

American manufacturers have in recent years more closely studied foreign countries, particularly South America, to discover markets for their wares, and when conditions favored have, after observing local requirements concerning license and securing necessary protection of trade-mark laws, promptly entered this remunerative field or essayed to educate an indifferent public to new desires.

One other error our exporters make, which probably costs them many thousands each year, is their practice of lettering the bales and cases containing their goods in English. I have often seen at the custom house here boxes, &c., labeled, "Fragile, handle with care." Or, in other cases, "This side up, with care." Now, as a matter of fact, we might as well expect a stevedore in New York to read the labels on a Chinese tea chest as to ask the men who handle foreign goods in this port to read English. It gives them trouble enough to decipher their own language when plainly printed. Consequently, when the bale, package or case enters the steamer at New York, all warnings, caution or advice printed upon it might as well be done in uncial Greek as in English.

The Hanna Automatic Quick Acting Vise.

The accompanying cuts represent stationary solid jaws, and swivel jaw and swivel base vises manufactured by the Hanna Engineering Works, 820 Elston avenue, Chicago, Ill. The shank of the movable jaw is a hollow cylinder of large diameter, to make a strong and rigid guide bar. Above this bar, and as close to the jaws as is possible without cutting down the necessary clear depth at this point, is the screw ratchet bar, which, it is explained, thus takes its logical and proper position for maximum efficiency—the greatest clamping force with least stress and strain. The quick action ratchet is of rectangular form, 10 teeth in length, and placed within the fixed jaw, while the greater portion of the clamping bar is cut with corresponding straight ratchet teeth. The outer end of the bar is cut with a plain square thread, upon which works a solid nut. The thread length is from 1½ to 3 inches more than that of the nut, according to the size of the vise, this extra length serving to give a considerable range of movement of the jaw under positive screw action. The ratchet is at the side of the bar, held in contact with it by two springs bearing against the plate, seen in the engravings, covering the recess in the fixed jaw. The working position of the ratchet bar is shown in Fig. 2, where the teeth are vertical, so as to face the ratchet. Under these conditions the vise may be closed quickly, but not opened. The springs actuating the ratchet permit it to recede sufficiently to allow the ratchet bar to be rotated through 90 degrees, bringing it into the position of Fig. 1, so that the ratchet bears against the uncut portion of the bar, thus providing for easy movement of the vise in either direction. The operating handle passes through an eccentric hole in the solid nut upon the outer end of the clamping bar. A cap screw secures a washer against the end of the bar to serve as a stop for the nut. When the nut is unscrewed until it comes into contact with this stop further movement of the handle causes rotation of the screw ratchet bar into the position of Fig. 1, when the vise may be freely opened or closed. Closing the vise quickly against the work to be held, the first movement of the handle returns the ratchet bar to the working position, Fig. 2, under the action of a spring within the movable jaw. The ratchet is thus brought into engagement and further movement of the lever handle rotates the nut upon the screw, clamping the work firmly and positively, just as in a plain vise. In releasing the work the first movement of the handle removes the strain, the disengagement of the ratchet for quick action following only after all stress is off. Since the screw action begins always from the outer end of the thread, the full value of the excess of thread length is available whenever wanted. Fig. 2 shows the nut advanced to the full length of the thread. Lightness has been sought in the construction of the vise so far as is consistent with needed strength and rigidity. Several sizes are made in each of four styles, the latter including the four combinations of solid and swivel fixed jaw with stationary and swivel bases. Fig. 1 shows the fixed jaw and stationary base, while Fig. 2 illustrates the swivel jaw and swivel base style. In the design of the vise the aim has been to include with the desirable quick action feature the essential and characteristic advantages of the plain, solid nut vise—positive action, durability and considerable possible range of movement under maximum strain.

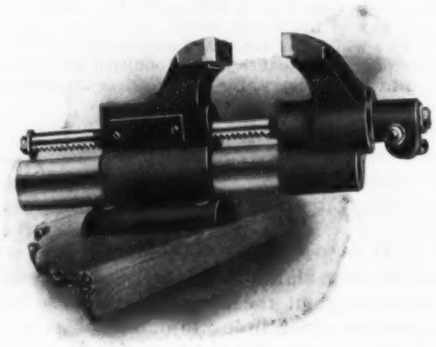


Fig. 1.—The Hanna Automatic Quick Acting Vise.

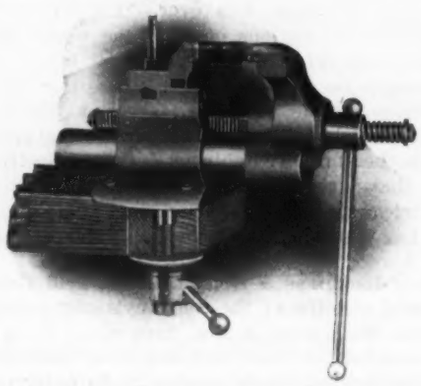
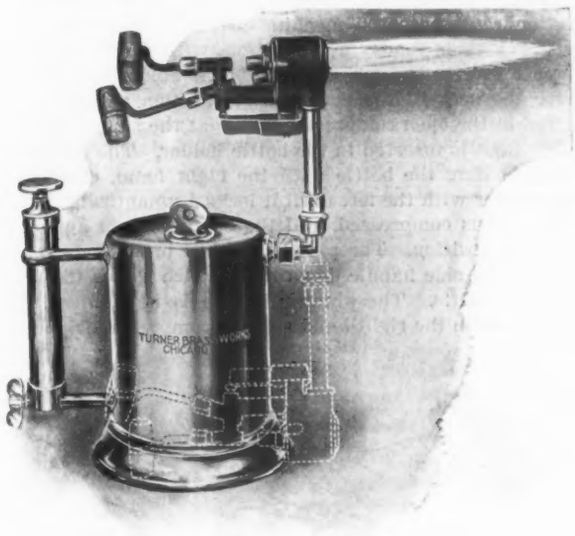


Fig. 2.—Swivel Jaw and Swivel Base Vise.

Double Jet Gasoline Torch No. 4 B.

The Turner Brass Works, 48 North Franklin street, Chicago, are placing upon the market a new double jet gasoline torch, No. 4 B, as illustrated herewith. For this they claim many advantages over the regular type of Turner double jet torch, as used by rubber tire workers, electricians and mechanics in general. The burner

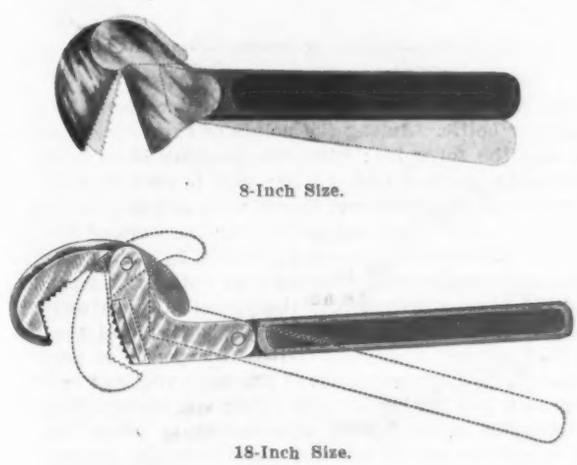


Double Jet Gasoline Torch No. 4 B.

of the torch is swiveled, permitting it to be turned in almost any position. The accompanying illustration shows the burner in an upright position, and the dotted lines at the base of the reservoir indicate the extreme points at which the burner can be placed on either side. This torch is fitted with the Turner double jet burner, in which the supply of air and gas is independently controlled by the operator. It is further claimed that the peculiar construction of the burner secures the maximum degree of heat from gasoline.

The Allen Automatic Pipe Wrench.

The Norwall Mfg. Company, 40 Dearborn street, Chicago, are placing on the market the new automatic pipe wrench which is here illustrated. The claim by the man-



8-Inch Size.

18-Inch Size.

The Allen Automatic Pipe Wrench.

ufacturers is that the wrench will instantly and automatically adjust itself to grip any size of pipe within its range, and instantly and automatically unlock when pressure is removed. The jaw is removable, and can be replaced or resharpened with ease. The tool is made in two sizes, 8-inch, to grip ⅛ to ¾ inch pipe, and 18-inch, to grip ¾ to 2 inch pipe.

Sherman Hose Coupling.

The accompanying cut represents hose couplings with ferrules, which give a finished appearance to the hose. The couplings are made from sheet brass, free from sand holes and other defects. The double knurled flanges on the nut afford a grip for the hand, full waterway and

Sherman Hose Coupling.

deep corrugations for imbedding into the lining of the hose. There are no soldered joints in the couplings, all parts being seamless. They are offered by H. B. Sherman Mfg. Company, Battle Creek, Mich., who state that hose coupled as in the illustration has stood a water test of over 600 pounds without leaking at the couplings.

E-Z-Go Baby Walker.

The Minneapolis Bedding Company, Minneapolis, Minn., are offering the baby walker shown herewith. It is made of ⅜-inch steel, so as to be indestructible, en-

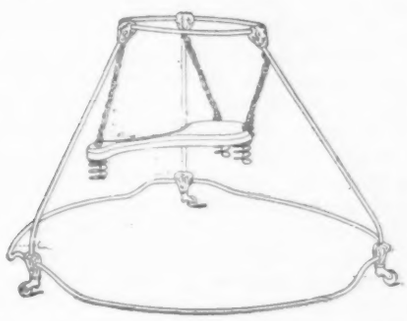


Fig. 1.—E-Z-Go Baby Walker.

ameled in colors, fitted with good casters and has the base formed so as not to tip over. It has a hard wood varnished seat, adjustable to any hight, with springs under-

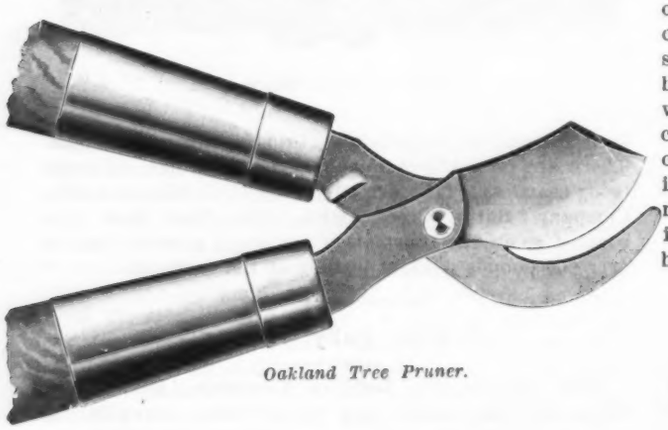
Fig. 2.—Baby Walker in Use.

neath. For shipment six walkers are nested in a crate, assorted colors, two each blue, green and red.

The Millstadt Lumber Company, Millstadt, Ill., have been incorporated to deal in lumber and Farm Implements. The capital stock is $6000. Those interested in the new company are H. W. Dohrmann, A. C. Kern and George Sauthoff. Mr. Sauthoff is secretary and treasurer.

Oakland and Redlands Pruners.

Seymour Smith & Son, Oakville, Conn., John H. Graham & Co., 113 Chambers street, New York, selling agents, have put on the market the Oakland pruner, here illustrated. The pruner is designed to satisfy a demand for an extra strong article, and is constructed to successfully withstand the severest tests. Both blade and hook, we are advised, are made from the best cast steel, forged directly from the bar, carefully tempered and well made



Oakland Tree Pruner.

throughout, while the wood handles are fitted with long steel ferrules. Especial attention is called to the shape of the hook, which is sharply curved in order that the limb may be pulled toward the bolt in cutting, instead of being pushed toward the point of the shear. The size of the shanks in the pruner is alluded to, they being very much heavier than has been the custom heretofore. The Oakland has 4-inch steel ferrules, wood handles, weighs 3½ pounds and is 26 inches long. Another new pruner of somewhat similar character is the Redlands, a California pattern. It is all steel and somewhat lighter than the Oakland, made of cast steel, forged from the bar and modeled along the lines of a pruner much used on the Pacific Coast. It is 26 inches long and weighs 3 pounds.

Norton Ball Bearing Jack.

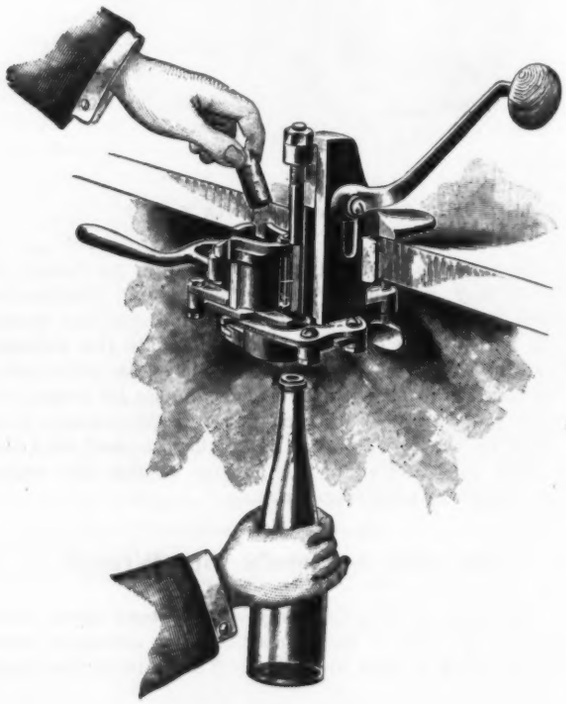
A. O. Norton, 286 Congress street, Boston, Mass., has recently designed and brought out a ball bearing ratchet screw jack having a capacity of 60 tons, and which is intended for use under 80,000 and 100,000 pound loaded cars, as well as for wrecking equipment, of which two

Norton Ball Bearing Jack.

illustrations are herewith given. This jack is similar in construction to the earlier type of Norton ball bearing jack in that the gears are cut from solid steel forgings, and it has ball bearings to reduce the friction. All the working parts are protected from grit and rust, and being a screw jack without, filling packing or valves, it is stated, it is absolutely safe under all conditions; that it cannot slip or drop the load and is always ready for instant use.

Invincible Hand Power Bottle Corking Machine.

The bottle corking machine shown herewith is offered by Hugo Reisinger, 11 Broadway, New York. The illustration represents the machine attached to a solid bar or heavy table ready for operation, with the compressor open to receive the cork and the bottle holder open to receive the neck of the bottle. In operation a cork is inserted in the open compressor, while at the same time the bottle neck is inserted in the bottle holder. The operator, while holding the bottle with the right hand, closes the compressor with the left until it locks automatically. The cork is thus compressed, and the bottle is held automatically in position. The plunger is then brought down by moving the side handle downward, which forces the cork into the bottle. The plunger handle is now raised, the bottle held in the right hand and the compressor is opened



Invincible Hand Power Bottle Corking Machine.

with the left hand, leaving the machine ready to cork another bottle. Among the points of excellence referred to are the following: That the machine is suitable for all corks up to 2 inches long; that it may be used for corking all kinds of beer, liquor, wine and mineral water bottles, quarts, pints and splits; that the work of precompressing the cork is greatly facilitated by the side swinging cork compressor, which works entirely independent of the plunger movement; that practically no moisture or juice from the cork enters the bottle; that the simplified plunger movement doubles the power of leverage and effects a concentration of the force required to drive the cork into the bottle, saving time and energy; that the automatic bottle holder, constructed to grasp tightly, hold and center any size and shape of bottle, prevents all breakage, and that the machine is compact, weighing 7 pounds and being 7 inches in hight; that it is simple in construction and convenient for use. The machines are packed differently for home and export trade.

J. B. McAlester, South McAlester, Ind. Ter., has been succeeded by the J. B. McAlester Hardware Company, who have been incorporated with a capital stock of $50,000. The company are expecting soon to take possession of a new building which is in course of construction.

Current Hardware Prices.

REVISED OCTOBER 27, 1903

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

Adamite in Carloads:
Crystal..... ₱ ton $90@100
Grain..... ₱ ton $120@140
See also *Emery*.

Adjusters, Blind—

Domestic, ₱ doz. $3.00.....33⅓%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....25%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Armand Hammer, Wrought ₱ lb 8¼@8¾¢
Buel Patent Trenton.....₱ lb 9¼@9¾¢
Eagle Anvils..... ₱ lb 7¼@7¾¢
Hay-Budden, Wrought.....9¢@9¼¢
Horseshoe brand, Wrought.....9¢@9¼¢

Imported—

Peter Wright & Sons..... ₱ lb 10½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.....30&5%

Augers and Bits—

Com. Double Spur.....70¢10@75%
Boring Machine Augers....66⅔@70%
Car Bits, 12-in. twist.....60@60¢10%
Jennings' Pattern.....50¢10¢5@50%
Ford's Auger and Car Bits.....40¢5%
Forstner Pat. Auger Bits.....35%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jennings' List..40&7½¢10%
Russell Jennings'.....25¢10¢2½¢5
L'Hommedieu Car Bits.....15&10%
Mayhew's Countersink Bits.....45%
Millers' Falls.....50&10¢2½¢5
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50&10%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $15; large, $26.....50&10%
Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18.....50&10%
Ford's, Clark's Pattern.....50&10¢60%
C. E. Jennings & Co., Steer's Pat..25&10%
Swan's.....60%

Gimlet Bits—

Common Double Cut..gro. $2.75@3.00
German Pattern.....gro. $4.00@4.25

Hollow Augers—

Bonney Pattern, per doz. $10.00@11.00
Ames.....35&10%
New Patent.....35&10%
Universal.....40%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.00
Unhandled, Shouldered..gro.65@65c
Unhandled, Patent.....gro. 66@70¢
Peg Awls:
Unhandled, Patent....gro. $1@1¼c
Unhandled, Shouldered.gro.65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00
Blackwood.....40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, factory brands...$5.50
First Quality, jobbers' brands.....$5.00@5.25
Second Quality.....$4.50@4.75

Axle Grease—See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar.....4¼@5c
Concord, Solid Collar.....4¾@5¼c
No. 1 Common.....
No. 1 ½ Com. New Style.....
No. 2. Solid Collar.....
Nos. 11 to 14.....
Nos. 15 to 18.....
Nos. 19 to 22.....
} See Trade Report.

Boxes, Axle—

Common and Concord, not turned..lb. 4¼@4¼c
Common and Concord, turned.....lb. 5@5¼c
Half Patent.....lb. 9@9½c

Balances— Sash—

Caldwell new list.....50%
Pullman's.....60%

Spring—

Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30
Pelouze.....50%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb., per lb..3@3½c

Towel—

No. 10 Ideal, Nickel Plate.....₱ gro, $8.50

Beams, Scale—

Scale Beams, List Jan. 12, '82.40¢10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters— Egg—

Lightning Chain, ₱ gro.....$15.00
National Mfg. Co.: ₱ gro.
No. 1 Dover, Family size.....$7.00
No. 2 Dover, Hotel size.....14.00
Taplin Mfg. Co.: ₱ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd..$17.00
No 200 Imp'd Dover Tumbler.....$8.50
No. 202, Imp'd Dover Tumbler Tin'd $9.00
No. 300, Imp'd Dover Mammoth, ₱ doz.....$5.00
Wonder (S. S. & Co.)....₱ gro. net, $6.00

Bellows—

Blacksmith, Standard List..75@75&5%

Blacksmiths'—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each..	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:
Each..$4.00 4.55 5.10 5.60 6.40 7.50

Moulders—

Inch.....	*10*	*12*	*14*
Doz.....	*$8.50*	*10.00*	*13.00*

Hand—

Inch.....	*6*	*7*	*8*	*9*	*10*
Doz.....	*$4.25*	*4.50*	*5.00*	*6.50*	*7.75*

Net Prices.

Bells— Cow—

Ordinary goods.....75¢5@75¢10%
High grade.....70¢10@70¢10¢5%
Jersey.....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....4%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Yankee Gong.....35%

Hand—

Hand Bells, Polished....60&5@60¢10%
White Metal.....55@55&10%
Nickel Plated.....50@50¢5%
Swiss.....60@60¢7½%
Cone's Globe Hand Bells....33⅓@33⅓&10%
Silver Chime.....33⅓@33⅓&10%

Miscellaneous—

Farm Bells.....lb. 2@2¼c
Steel Alloy Church and School.....60@60¢5%
American Tube & Stamp'g Co. Gongs..75%
Table Call Bells.....50@5&10%
Trip Gong Bells.....55&10@60%

Belting— Rubber—

Agricultural (Low Grade)..75@75¢5%
Common Standard.....70@70¢10%
Standard.....65@70%
Extra.....60¢5@60¢10%
High Grade.....59¢5@50¢10%
Boston Belting Co.:
Seamless Stitched Imperial.....45&5%
Boston.....50&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap....60@60¢5%
Regular Short Lap 60¢10@60¢10¢10%
Standard.....70@70¢5%
Light Standard.....70¢10%
Cut Leather Lacing.....60¢10%
Leather Lacing Sides, per sq. ft..18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters.....20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.5; No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....70¢10@75¢5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50¢10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50¢10%
Stowell's Self Loading.....60%
See also *Machines, Hoisting.*

Boards, Stove—

Zinc, Crystal, &c.....30¢10@40¢10%

Bolts—

Carriage, Machine, &c.—

Common Carriage.....70¢@70¢10%
Phila. Eagle, $3.00 list May 24, '99.....80@80¢5%
Bolt Ends, list Feb. 14, '95..65¢5@65¢10%
Machine, list Oct. 1, '99.....70@70¢5%
Machine with C & T. Nuts.....60¢10@...%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.25*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.35*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.87*	*.80*	*1.00*

Wrt Barrel, Jap'd..75¢10@75¢10¢10%
Wrought " Bronzed..40¢5@50¢10%
Wrought Flush, B. K..50¢10@60¢10%
Wrought Shutter...40¢10¢10@60¢5%
Wrought Square Neck.....50@50¢10%
Wrought Sunk, Flush....50@50¢10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....60@60¢5%
Stove.....30@30¢10%

Tire—

Common.....72½@72½¢10%
Norway Iron.....80@80¢5%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila. list Oct. 16, '84.....82½%
Bay State, list Dec. 28, '99.....72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84.....82½%
Eclipse, list Dec. 28, '99.....72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99.....72½%
Norway Phila., list Oct. '84.....80%
Union Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.30*	*5.00*	*5.75*	*7.25*
Inch.....		*2¼*		*2½*
Per Doz.....		*$8.65*		*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25&10%
Langdon.....15&10%
Perfection.....₱ doz. $6.00
Schatz.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American..$1.15@1.25
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford s.....60%
Fray's No. 70 to 120, 81 to 143, 207 to 414.....60%
C. E. Jennings & Co.....50&5&10%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Patent..50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co. Peck's Patent60&10¢65%

Brackets—

Wrought Steel.....80@80¢5%
Bradley's Wire Shelf:
Full cases.....85%
Broken cases.....80&10&10%
Griffin's Pressed Steel.....80%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks Saw—

Hoosier..... ₱ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—

Wrought list Sept., '96....30@30¢10%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@50¢10%
Fast Joint, Narrow.....50@50¢10%
Loose Joint.....70¢5@70¢10%
Loose Pin.....70¢5@70¢10%
Mayer's Hinges.....70&5@70¢10%
Parliament Butts.....70¢5@70¢10%

Wrought Steel—

Table and Back Flaps.....75%
Narrow and Broad.....75%
Inside Blind.....75&10%
Loose Pin.....75¢10%
Loose Pin, Ball and Steeple Tip.....60¾&5%
Japanned, Ball Tip Butts.70¢10%
Bronzed Wrt. Nar. and Inside Blind Butts.....55¢10%

Extra 10@10¢10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓&5%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb..4@4¼c
Sharp, 1 prong.....per lb. 4½@4¾c
Perkins' Blunt Toe.....cents, ₱ lb .365
Perkins' Sharp Toe.....cents, ₱ lb .415

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	64.20	129.60 gro., net

Caps—Percussion—

Eley's E. B......60c
G. D.....*per M 34@35c*
F. L.....*per M 40@45c*
G. E.....*per M 50@51c*
Musket.....*per M 62@63c*

Primers—

Berdan Primers, $2.00 per M...20@25%
B. L Caps (Sturtevant Sheus) $2.00 per M.....20%
All other primers per M. $1.52@$1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10@5%
38 C. F., $7 00.....10@5%
22 cal. Rim, $1 50.....10@5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con., Ball Swgd.....$1 90
B. B. Caps, Round Ball.....$1.49
Central Fire.....25%
Target and Sporting Rifle.....15@5%
Primed Shells and Bullets.....15@10%
Rim Fire Sporting.....50%
Rim Fire, Military.....15@5%

Cases, Show—

Sun, No. 102, Silent Salesman, 6 ft., $25.00

Casters—

Bed.....70@70@10%
Plate.....60@60@5%
Philadelphia.....75@75@10%
Boss.....70@10%
Boss Anti-Friction.....70@10%
Martin's Patent (Phœnix).....45%
Smith & Hemenway Co.....33⅓%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3-16	¼	5-16	⅜	7-16	½	9-16
8.50	5.50	4.40	4.00	3.80	3.70	3.65
⅝	¾	⅞	1 to 1¼ inch.			
3.60	3.55	3.50	3.40	per 100 lb.		

German Coil.....60&10c@10%

Halters and Ties—

Halter Chains.....60c@10@60c@10c@10%
German Halter Chains, list July 24, '97.....60c@10&10@70c@10%
Cow Ties.....60@60c@10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$26.00
6½—6-2, Straight, with ring..$33.50
6½—8-2, Straight, with ring..$30.00
6½—10-2, Straight, with ring..$35.00
Add 2c per pair for Hooks.
Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains..60@60c@10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60c@10@60c@10c@10%
Brass.....60c@10@60c@10c@10%
Safety Chain.....70&10@75c@5%
Gal. Pump Chain.....lb. 4½@4¾c
Covert Mfg. Co.
Breast.....40&2%
Halter.....40&2%
Heel.....40&2%
Rein.....40&2%
Stallion.....40&2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. C ll and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halters.....45@50&5%
Niagara Coil and Halters.....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Niagara Wire Dog Chains...45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 40c
Carpenters', Red.....gro. 35c
Carpenters', White.....gro. 30c
See also Crayons.

Checks, Door—

Bardsley's.....45%
Columbia.....50&10%
Eclipse.....60&10%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Fitters' Chests, Empty.....30%
C. E. Jenning. & Co.'s Machinists' Tool Ches s.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List.....70@70c@10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70%
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers.....40c@5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181.....16⅔&10%
L. & I. J. White, Tanged.....25&5%

Cold—

Cold Chisels, good quality.lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary.....*lb. 9 @10c*

Chucks—

Beach Pat., each $8.00.....35&5%
Pratt's Positive Drive.....25%
Empire.....25%
Blacksmiths'.....25%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard..30%
Drill Chucks, New Model.....20%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....25%
Universal Lathe Chucks.....40%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent.....50%
Independent Steel.....40%
Union Drill.....45%
Universal.....50%
Independent Iron Face Plate Jaws..40%
Independent Steel Face Plate Jaws..40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....40%
Little Giant Double Grip Drill.....40%
Little Giant Drill, Improved.....40%
Oneida Drill.....40%
Scroll Combination Lathe.....40%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....50%
Carriage Makers' Sargent's.....60%
Besly, Parallel.....33⅓&10%
Linemans' Utica Drop Forge & Tool Co40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel....₱ doz. $4.05 net
Star Shank, All Steel....₱ doz. $3.24 net
W. & C. Shank, All steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....$10.75 }
20th Century Horse, each, $5.00.....20%
Lightning Belt.....$15.00 } 15%
Chicago Belt.....$20.00 }
Stewart's Patent Sheep.....$18.50

Finger Nail Clippers—

Smith & Hemenway Co.....doz. net $2.00

Clips, Axle—

Eagle and Superior ¼ and 5-16 inch.....70c@10%
Norway, ½ and 5-16 inch..70@70c@10%

Cloth and Netting, Wire

—See Wire, &c.

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs.....65c@10@70c@5%
Globe, Kerosene, Racking, &c., Cocks.....65c@5@70c@5%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Brass, Walter B. Stevens & Son's list.40%
Embossed, Gilt, Walter B. Stevens & Son's list.....30&10%
Leatner, Walter B. Stevens & Son list40%

Combs, Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses Dividers, &c.

Ordinary Goods.....75@75@5%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%

Compressors, Corn Shock—

J. B. Hughes' ₱ doz.....$2.50

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
Eastern....	70c@12½%	70c@7½%
Central....	70c@7½%	70%
Southern...	65c@10%	65c@5%
S. Western..	65c@7½%	65c@2½%

Terms, 2% for cash. With delivery on full crates.
See also *Eave Troughs.*

Coolers, Water—

Gal, each	½	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	2.70
Gal.	½	3	4	6	8
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal....	2	3	4	6	8
Galv. Lined Ea.	$1.85	$2.00	$2.25	$2.90	$3.90

25%

Ga.v. Lined side handles

Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15..25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....*lb. 27@28c*
Braided, White, Com.....*lb. 19@22c*
Cable Laid Italian..*lb. A, 18c; B, 16c*
Common India.....*lb. 10@10½c*
Cotton Sash Cord, Twisted....*12@16c*
Patent Russia.....*lb. ..@13c*
Cable Laid Russia.....*lb. ..@14c*
India Hemp, Braided.....*lb ..@18c*
India Hemp, Twisted.....*lb. 12@13c*
Patent India, Twisted.....*lb.12@13c*
Anniston Cordage Co.:
Old Glory, Nos. 7 to 12.....₱ b 24 ¢
Anniston, Nos. 7 to 12.....₱ b 19 ¢
Old Colony, Nos. 7 to 12.....₱ b 18½¢
Anniston Drab, Nos. to 12.....₱ b 24 ¢
Pearl Braided, cotton, No. 6 ₱ b, 20¢; Nos. 7 to 2, 19¢.
Eddystone Braided Cotton.....₱ b 19¢
Harmony Cable Laid Italian.....₱ b 18¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton.....₱ b 32½¢
Braided, Italian Hemp.....₱ b 32½¢
Braided, Linen.....₱ b 40¢
Braided, White Cotton, Spot.₱ b 28½¢
No. 6 cords, 1¢ extra.
Massachusetts, White.....₱ b 24 ¢
Massachusetts, Drab.....₱ b 28 ¢
Phœnix, White.....20¢
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....15%

Wire, Picture—

List Oct., '00.....*85c&10@85c@10c@10%*

Cradles—

Grain.....50%

Crayons—

White Round Crayons, gross. 5½@6c
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.
Jumbo Crayons.....gr. $3.50 } 20% Case lots
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr.$1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2 50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $3.00
No. 77 Medium Knives.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.....	1	2	3	4	5	6
Each.....	$5	$7	$10	$25	$50	$60

Enterprise.....25@25&7½%

Nos.....	5	10	12	22	32
Each.....	$2	$3	$2.75	$4.50	$6

Dixon's, ₱ doz.....30&10@40%

Nos..	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....4&10@50%
Little Giant, ₱ doz.....33⅓@40%

Nos.	305	310	312	390	322
	$35.00	$48.00	$44.00	$73.00	$68.00

N. E Food Choppers.....40%
New Triumph No. 605, ₱ doz. $24.00.....30&10@40%
Russwin Food No. 1, $24.00; No. 2, $27.00.....45&10&10%
Sterling.....40@40&10%

No 1....	$2.00 each	No. 2..	$2.50 each

Woodruff's, ₱ doz.....30&10@40%

Nos.....	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00
Sterling $6.00 each.....33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr....$22@$36

Tobacco—

All Iron, Cheap.....*doz. $4.25@$4.50*
Enterprise.....25@50%
National, ₱ doz. No. 1, $21; No. 2, $18..40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's No 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz. $16.00.....50&10&10%
Bonney's.....33⅓%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₱ doz.....$6.75
Iwan's Perfection Post Hole Digger...₱ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ₱ doz.....$7.50
Kohler's Universal.....₱ doz, $15.00
Kohler's Little Giant.....₱ doz. $12.60
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9 60
Kohler's Rival.....₱ doz. $8.50
Kohler's Pioneer.....₱ doz. $7.50
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, 7x9 in.....₱ doz, $10.50
Phillips', style 077, 7x9 in.....₱ doz. $8.00
Phillips', style x-y, 7x9 in.....₱ doz, $11.00
Porter's Plain, No. 6.....₱ doz. $6 75
Porter's Ornamental, No. 70. ₱ doz. $10.50
Porter's No. 99.....$9.00
Porter's No. 44.....$10.75

Drawers, Money—

Sun Money Drawers, No. 5, ₱ doz. $8.50; No. 6, with Bell, $10.00; No. 6, with Gong, $10.50.
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill...each $1.50@$1.75
Breast, Millers Falls.....15c10%
Breast, P., S. & W.....40@5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3.....16⅔&10%
Johnson's Drill Points.....16⅔&5&10%
Millers Falls Automatic Drills....33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P. S. & W.....50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....*60c&10@60c&10c&10%*
Taper and Straight Shank.....*60c&10@60c&10c&5%*

Drivers, Screw—

Screw Driver Bits..per doz. ..45@75c
Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9.....40%
Buck Bros' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet.....35%
Goodell's Auto50&10&10@50&10&10&5%
Burwood.....40%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21.....35&10%
Millers Falls, Nos. 11, 12, 41 ,42.....15&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles30@60&10&10%
No. 86.....70@70&10&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*	
Eastern.....	75c	16⅔%
Central.....	75c	12½%
Southern.....	75c	2½%
S. Western.....	75c	

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments.....60%
Perfect Elbows (S. S. & Co.).....30%

Emery, Turkish—

	4 to 46	5 to 150	Flour
Kegs.....	*lb. 5c*	5½c	3½c
½ Kegs.....	*lb. 5½c*	5¾c	3¾c
Kegs.....	*lb 5c*	6c	
10-lb cans. 10 in case	6½c	7c	6c
10-lb. cans, less than	10c	10c	8c

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....50%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....*50@50c10%*
*Metallic Key, Leather Lind*70@70c10%
Red Cedar.....*40@40c10%*
Petroleum.....*70c@10@75c%*
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key.....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined.....50%
John Sommer's Reliable Cork Lined.....50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's No Brand, Cellar.....50%
John Sommer's Perfection Cedar.....40%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¼ and ⅜ inch.....35%
Self Measuring:
Enterprise, ₱ doz. $30.00.....40&10%
Lane's, ₱ doz. $30.00.....40&10%
National Measuring, ₱ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.

Best Brands.....	*70c&5@70c&10c&5%*
Standard Brands.	*75c&5@75c&10c&10%*
Second Quality....	*75c&10c&10@80c&5%*

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....30%

Fixtures, Grindstone—

Net Prices:

Inch....	15	17	19	21	24
Per doz.	$2.85	3.00	3.50	4.00	4.75

P., S. & W. Co.....30&10@10%
Reading Hardware Co.....60%
Sargent's.....60&10&10%
Stowell's Giant Grindstone Hanger, ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures Light...60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

Base Discounts Aug. 1, 1893, list;
Hay, 2 tine ..... 50&10c&5%
Boys', & Fish, 2 tine ..... 50&10c&5%
Hay & Boys', 3 tine ..... 60&5%
Hay & Boys', 4 tine 66⅔%
Champion Hay 66⅔%
Hay & Header, long 3 tine 6.%
Header, 4 tine 65%
Barley, 4 & 5 tine, Steel ..... 60&20%
Manure, 4 tine ..... 60&15&2½%
Manure, 5 and 6 tine ..... 66⅔&2½%
Spading ..... 70&2½%
Potato Digger, 6 tine ..... 60&10%
Sugar Beet 50%
Coke & Coal 50%
Heavy Mill & Street 65%
Iowa Dig-Eay Potato 65%
Victor, Hay 66⅔%
Victor, Manure 66⅔%
Victor, Header 66⅔%
Champion, Hay 66⅔%
Champion, Manure ..... 60&20%
Columbia, Hay ..... 66⅔&5%
Columbia, Manure 70%
Columbia, Spading ..... 70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger ..... 60&12½%
Acme Hay ..... 60&10&5%
Acme Manure, 4 tine ..... 60&20&7½%
Dakota Header ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Header 66⅔%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

Fountains, Stock—

Double Dewey ..... ₱ doz. $13.00

Frames— Saw—

White, Straight Bar, per doz. 75@80c
Red, Straight Bar, per doz $1.00@$1.25
Red, Double Brace, per doz. $1.40@1.50

Freezers Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best..	$1.55	1.65	1.95	2.40	3.20	4.00
Good	$1.25	1.40	1.80	2.00	2.70	3.60
Fair..	$1.00	1.10	1.30	1.75	2.30	2.90

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Temp Fuse ..... $2.60 }
Cotton Fuse ..... 2.90 }
Single Taped Fuse ..... 3.25 } 10&2½%
Double Taped Fuse ..... 4.20 }
Triple Taped Fuse ..... 5.00 }

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&10%

Gauges—

Marking, Mortise, &c. ..... 50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, etc. 50&10@50&10&10%
Scholl's Patent ..... 50&10@50&10&10%
Door Hangers ..... 50@50&10%
Fulton's Butt Gauge ..... 30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 20@20&10&10%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire P., S. & W. Co ..... 30&10%

Gimlets— Single Cut—

Nail, Metal, Assorted, gro. $1.40@1.50
Spike, Metal, Assorted gro. $2.80@3.50
Nail, Wood Handled, Assorted. gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $4.25@4.50

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co ..... 60@60&10&10%

Glue—Liquid Fish—

Bottles or Cans, with Brush....25@50%
Cans (½ pts., pts., qts., ¼ gal., gal.) ..... 25@48%
International Glue Co. (Martin's) ..... 40&10@50%

Grease, Axle—

Common Grade ..... *gro. $4.70@5.50*
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs., ₱ doz. 1 lb $1.20; 2 lb $2.00

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz. ..... $2.00 }
Pike Mower Knife and Tool Grinder, each ..... $6.00 } 33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

Halters and Ties—

Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 40&5&5%
Steel Rope ..... 20&2%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Steel Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties.. 70%
Steel Rope Ties ..... 60&10%

Hammers—

Handled Hammers—

Belcher's Machinists' ..... 40&10@40&10&10%
Belcher's Farriers ..... 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.35, $1.50, $1.75 ..... 40@40&10@40&10%
Peck, Stow & Wilcox ..... 40&10&5%
Fayette R. Plumb:
Plumb, A. E. Nail ..... 33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand ..... 50&7½&5@50&10&7½&5%
Machinists' Hammers 50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%
Sargent's C. S. New List 40%

Heavy Hammers and Sledges—

Under 3 lb.....lb 50c }
3 to 5 lb.....lb. 4½c } 70&10@75
Over 5 lb.....lb. 30c }
Wilkinson's Smiths'.....9½c@10c lb. d10%

Handles—

Agricultural Tool Handles—

Axe, Pick, &c. ..... 45@50&5%
Hoe, Rake, &c. ..... 45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles ..... 45@50&5%
D Handles 40%

Cross-Cut Saw Handles—

Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted.....gro. $2.50@$2.75
Brad Awl.....gro. $1.65@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.60@$2.75; large, $3.25@$3.50
Hickory Tanged Firmer, gro. ass'd. $2.50@$2.75; large, $3.15@$3.25
Apple Socket Firmer, gro. ass'd, $2.25@$2.50; large, $3.00@$3.25
Hickory Socket Firmer, gro. ass'd. $2.00 @ $2.25; large, $2.25 @ $2.50
Hickory Socket Framing, gro. ass'd. $3.00@$3.25; large, $3.25@$3.50
File, assorted.....gro. $1.25@$1.35
Hammer, Hatchet, Axe, &c. 50%
Hand Saw, Varnished, doz. 60@70c
Not Varnished ..... 55@60c
Plane Handles:
Jack, doz. 25c; Jack Botted..55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle, ₱ gro ..... $0.35@$1.50

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch.....	*3*	*4*	*5*	*6*	*8*
Single Doz.	$0.90	1.25	1.60	1.95	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.....	$1.30	1.85	2.50	3.00

Alith Mfg. Co.
Reliable ..... per doz. $15.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle 60%
Roller Bearing ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing $4.15
Parlor, Standard $3.35
Parlor, New Model $2.85
Parlor New Champion $2.25
Barn Door, Standard. 50&10&10&5%
Covered ..... 50&10&10%
Special ..... 50&10&10&5%
Lawrence Bros.:
Advance 60%
Cleveland ..... 60&10%
Crown 60%
Giant ..... 50&10%
New York 60%
Peerless ..... 60&10%
Sterling 60%
Swing, No. 95 ..... 60%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00 ..... 60%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers 60%
C. S. Smith Mfg. Co.:
Lundy Parlor Door ..... 50&10%
Monarch Barn Door ..... 60&10%
Never Jump Hinge ..... 50&10%
Peerless ..... 60&10%
Perfection ..... 70&5%
Phœnix ..... 70&5%
Wagner's Adjustable ..... 70&10%
Warehouse Anti-Friction 60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3 ..... $2.25
Imp'd Wood Track No. 5 ..... $2.25
Imp'd Steel Track No. 7 ..... $2.70
Imp'd Steel Track No. 7 ..... $2.65
Ball B'r'g Steel Track No. 9 ..... $2.50
Ball B'r'g Steel Track No. 10 ..... $2.50
Roller B'r'g Steel Track No. 11 ..... $2.45
Roller B'r'g Steel Track No. 12 ..... $2.40
Ball B'r'g Steel Track No. 13.. $3.75
Roller B'r'g Steel Track No. 14. $2.65
Ball B'r'g Trolley Track No. 15 ..40%
Ball Brg Trolley Track No. 19 ..40&5%
Ball Bearing Tandem Trolley Track No. 16 ..... 40%
Silent Adjustable Track No. 18 ..40%
Auto Adjustable Track No. 22.. 40%
Trolley B. D. No. 17 ..... $1.60
Trolley F. D. No. 120 ..... $2.70
Trolley F. D. No. 121 ..... $2.55
Trolley F. D. No. 151 ..... $3.00
Roller Bearing D. D. No. 25.... 70&5
Roller Bearing U. S. B. D..... 70&5%
Anti Friction B. D ..... 60&10%
Ives' Wood Track No. 1 ..... $2.15
Ives' Imp'd Wood Track No. 2.. $2.15
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing 40%
Ajax Hinge Door 60%
Apex Parlor Door ..... 50&10&5%
Atlas 60%
Baggage Car Door 50%
Climax Anti-Friction ..... 50&10%
Elevator 40%
Express 50%
Freight Car Door 60%
Interstate ..... 40&10%
Lundy Parlor Door.. ..... 50&10%
Magic 60%
Matchless ..... 60&10%
Nansen ..... 70&5%
Par or Door ..... 50&10%
Railroad ..... 50&10%
Rex Hinge Door 60%
Street Car Door 50%
Steel, Nos. 300, 404, 500 ..... 50&10%
Underwriter's Fire Door 40%
Wild West Warehouse Door 50%
Zenith Par Wood Track ..... 50&10%
A. L. Swett Iron Works:
Eagle ..... 60&10%
Hylo ..... 50&10%
Perfection 60%
Pilot 60%
Taylor & Boggis Fry Co.'s Kidder's Roller Bearing ..... 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track ..... 60&10%
L.T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing 40%
Velvet 50%
Wilcox Auditorium Ball Bearing.20%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Elv. Door, Nos 112 and 122 ..... 50%
Wilcox Elv. Door, No. 132 ..... 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century ..... 50&10&10%
Wilcox O. K. Steel Track 50%
Wilcox O. K. Trolley 50%
Wilcox Trolley Ball Bearing 40%
Wilcox Wideman Narrow Gauge. Ball Bearing 40%
For Track, see *Rail.*

Extra 5@10% often given.

Hangers, Gate—

Myers' Patent Gate Hangers, ₱ doz., net, $4.50

Hasps—

McKinney's Perfect Hasp, ₱ doz 50%

Hatchets—

Best Brands ..... 50@50&10%
Cheaper Brands ..... 50@60&10%
Note.—Net prices often made.

Heaters, Carriage—

Clark, No 3, $2.25; No. 3D, $2.75; No 3E, $2.25; No. 1, $1.50 each 15%
Clark Coal, $0.75 ₱ doz 10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1888 O P Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.....	*1*	*3*	*5*
Doz. pair.....	$0.85	1.75	3.50

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.....	*1*	*1½*	*2*	*2½*
Doz. pair...	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.....	*1*	*1½*	*2*
Doz. pair....	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70@75%
Reading's Gravity ..... 50&5%
Sargent's, Nos. 1, 3, 5, 11 & 13 ..... 70&10@75%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80, with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter ..... 7 &5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75%
1888, Old Pat'n, Nos. 1, 3 & 5 ..... 75%
Tip Pat'n, Nos. 1, 3& 5 ..... 75%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75..75%
Steamboat Gravity Locking, No. 10. 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.....	*1*	*2*	*3*
Hinges with Latches..	$3.00	2.70	5.00
Hinges only.....	$1.50	2.05	3.30
Latches only.....	.70	.70	.35

New England:

With Latch.....doz	....@	$2.00
Without Latch ....doz.	....@	$1.60

Reversible Self-Closing:

With Latch.....doz.	....@	$1.75
Without Latch.....doz.	....@	$1.35

Western:

With Latch.....doz.		$1.75
Without Latch.....doz.		$1.15

Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches..	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.30
Latches only.....	.70	.70	1.35

Spring Hinges—

Holdback, Cast Iron.....gro. $9.00
Non-Holdback, Cast Iron...gro. $8.00

J. Bardsley
Bardsley's Non-Checking Mortise Floor Hinges 45%
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges 40%
Bommer Spring Hinges 40%
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House.. .. 25%
Keenan's Saloon Door 25%
Columbian Hdw. Co.:
Acme, Wrt. Steel 30%
Acme, Brass 35%
American 30%
Columbia, No. 14 ..... ₱ gr. $9.00
Columbia, No. 18 ..... ₱ gr. $25.00
Columbia, Adjustable, No. 7, ₱ gr. $12.00
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.50
Oxford, new list 30%
Lawson Mfg. Co.:
Marchisa 35%
Matchless Pivot 45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge 40%
Chief Ball Bearing Floor Hinge.45%
Royal Ball Bearing Floor Hinge..45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting 35%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges ..... 80&10%
Heavy Strap Hinges 80&20&10%
Light T Hinges ..... 75&10&5%
Heavy T Hinges ..... 75&5%
Extra Heavy T Hinges ..... 80&20%
Hinge Hasps 70%
Cor. Heavy Strap ..... 80&20&10%
Cor. Ex. Heavy T ..... 80&20%
Screw Hook and Strap. } *6 to 12 in* ..... *lb. 3½c*
} *14 to 20 in* ..... *lb. 3¼c*
} *22 to 36 in* ..... *lb. 3 c*
Screw Hook and Eye:
¾ to 1 inch ..... *lb. 6 c*
⅝-inch ..... *lb. 7 c*
½-inch ..... *lb. 9 c*

Ex 10@10&10%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers 35%

Hods, Coal—

	15	*16*	*17*	*18 inch.*
Galv. Open..	$2.50	2.75	3.00	3.25 ₱ doz.
Jap. Open..	$2.00	2.25	2.50	2.75 ₱ doz.
Galv. Funnel	$3.00	3.25	3.50	3.75 ₱ doz.
Jap. Funnel	$2.50	2.75	3.00	3.25 ₱ doz.

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar ..... each $1.45
Steel Brick ..... each $1.10

Hoes— Eye—

Scovil and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 23, 1899 ..... 60&10&10@70%
D. & H. Scovil 35%

Handled—

Aug. 1, 1899, List:
Field and Garden ..... 70&10%
Smith's Patent 50%
Meadow & Rhode Island 75%
Black Diamond ..... 70&10%
Mortar and Street ..... 70&10&10%
Planters' ..... 75&12½%
Cotton ..... 70&10&10%
Cotton Chopper ..... 75&12½%
Weeding Hoes ..... 66⅔&15%
Steel Weeders ..... 66⅔&15%
Malleable Weeders ..... 66⅔&15%
Ft. Madison Cotton Hoe ..... 75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. $5.00
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.60
Ft. Madison Dixie Tobacco Hoe.. 75&20%
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe 55%
W. & C. Ivanhoe ..... 75&2%
B. B. 6 in., Cultivator Hoe $3.15
B. B., 6¼ in $3.35
Acme Weeding ..... ₱ doz., net, $4.35
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00 ..... 45&10%

Door—

Empire 50%
Bardsley's 45%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓&40%

Hooks— Cast Iron—

Bird Cage, Reading ..... 50&10%
Bird Cage, Sargent's List 60%
Ceiling, Sargent's List ..... 50&10%
Clothes Line, Reading List 50%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List..50@50&10%
Clothes Line, Stowell's 70%
Coat and Hat, Reading 50%
Coat and Hat, Stowell's 70%
Coat and Hat, Wrightsville 65%
Harness, Reading List ..... 50&10%
Harness, Stowell's 60%
School House, Stowell's 70%

Wire—

Belt ..... 80&10%
Wire C. & H. Hooks ..... 70@70&10&5%
Atlas, Coat and Hat:
Single Cases 70%
10 Case Lots ..... 70&10%
Columbian Hdw Co. Gem ..... 60&10%

Wire Goods Co:
Acme ..... 60&10%
Chief 70%
Crown ..... 70&10%
Czar 65%
V Brace ..... 70&10%
Czar Harness ..... 50&10%

Wrought Iron—
Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ..... doz. $1.05@1.25
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

Miscellaneous—
Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass .....Nos. 1 2 3 4
Best $1.50 1.75 2.00
Common .. $1.30 1.50 1.60 1.60
Potato and Manure ..... 60&15%
Wh fletree ..... lb. 5¾@6c
Hooks and Eyes:
Brass ..... 60&10&10@70%
Malleable Iron ..... 70&5@70&10%
Covert Saddlery Works' Self Locking Gate and Door Hook 60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net

Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—
See *Shoes, Horse.*

Hose Rubber—
Garden Hose, ¾-inch:
Competition ..... ft. 4½@ 5 c
3-ply Standard ..... ft. 6½@ 7 c
4-ply Standard ..... ft. 7½@ 8 c
3-ply extra ..... ft. 8½@ 9 c
4-ply extra ..... ft. 10 @10½c
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft. 6 @7 c
Fair quality ..... ft. 8 @9 c

Irons— Sad—
From 4 to 10 ..... lb 3@3½c
B. B. Sad Irons ..... lb. 3¼@3½c
Chinese Laundry ..... lb. 4¾@5c
Chinese Sad ..... lb. 4@4¼c
Mrs. Potts', per set:
Nos 50 55 60 65
JapdTops 76@81 75@78 86@91 83@88
TindTops 79@84 76@81 89@94 86@91
New England Pressing, lb.. 3½@4c

Pinking—
Pinking Irons ..... doz. 50@60c

Soldering—
Soldering Coppers 2½ and 3..20@21c
1½ and 2 ..... 22@23c

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw ..... 80&5%
Steel ..... 45&2%
Covert's Saddlery Works':
Daisy ..... 60&10%
Victor ..... 60&10%
Lockport 50%
Lane's Steel ..... 30&10%

Kettles—
Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c 30%
Smith & Hemenway Co ..... 40&10%
Wilkinson Shear & Cutlery Co 50%
Hay and Straw—See *Hay Knives.*

Corn—
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List ..... 70&5@70&10%
Brad ley's 35%
C. E. Jennings & Co Nos. 45, 46 ..60&10%
Jennings & Griffin. Nos. 51, 52. 60&10&10%
Swan's ..... 70&10&2½%
Watrous ..... 16⅔&10%
L. & I. J. White ..... 20&5@25%

Hay and Straw—
Lightning ..... ₱ doz. $6.50@7.00
Iwan's Sickle Edge ..... ₱ doz. $10.00
Iwan's Serrated ..... ₱ doz. $10.00
Maine ..... ₱ doz. $8.50

Mincing—
Buffalo ..... ₱ gro. $13.00

Miscellaneous—
Farriers' ..... doz. $3.00@3.25
Wostenholm's ..... ₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber tip, gro ..... $1.10@1.15
Carriage, Jap, all sizes..gro. 40@45c
Door, Mineral ..... doz. 65@70c
Door, Por. Jap'd ..... doz. 70@75c
Door, Por. Nickel ...doz. $2.05@2.15
Bardsley's Wood Door, Shutter, &c ..15%
Picture, Sargent's ..... .60&10&10%

Lacing Leather—
See *Belting Leather—*

Ladders, Step, Etc.—
Lane's Store 25%
Myers Noiseless Store Ladders 50%

Ladies— Melting—
L. & G. Mfg. Co, Low List 25%
P. S. & W. 50%
Reading 60%
Sargent's ..... 45&10%

Lanterns— Tubular—
Regular Tubular No. 0. doz. $4.35@4.75
Lift Tubular..No. 0..doz. $4.75@5.25
Hinge Tubular. No. 0..doz. $4.75@5.25
Other Styles ..... 40&10@40&10&5%

Bull's Eye Police—
No. 1, 2¾ inch ..... $2.50@2.75
No. 2, 3 inch ..... $2.75@3.00

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron 50%
Stowell's Badger, Cast Iron 50%

Latches—
Thumb—
Roggin's Latches, with screw, dz 35@40c

Leaders, Cattle—
Small ..... doz. 55c; large, 60c
Covert Mfg. Co ..... 45&2%

Lifters, Transom—
R & E 33⅓%

Lines—
Wire Clothes, Nos... 18 19 20
100 feet $2.20 2.00 1.65
75 feet $1.80 1.70 1.30
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00: No. 3, $7.50 ₱ gr 30%
Anniston Waterproof Clothes, 50 ft., ₱ gro.: $24.00; Gilt Edge, $22.00; Air Line, $20.00; Acme, $17.00; Alabama, $16.00; Empire, $17.00; Advance, $14.00; Alliston, $18.00; Calhoun, $11.00; Oriole, $20.00; Albermarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $9.00.

Locks— Cabinet—
Cabinet Locks ..... 33⅓@33⅓&c71½%

Door Locks, Latches, &c.—
[Net prices are very often made on these goods.]
Reading Hardware Co 50%
R. & E. Mfg. Co 40%
Sargent & Co ..... 40&10%
Stowell's Steel Door Latches 50%

Elevator—
Stowell's 50%

Padlocks—
Wrought Iron ..... 75&c10&c5@80&c5%
R. & E. Mfg. Co. Wrt. Steel and Brass ..... 75@75&10%

Sash, &c.—
Ives' Patent,:
Bronze and Brass 62½%
Crescent 50%
Iron 62½%
Wrought Bronze and Brass 55%
Wrought Steel 55%
Reading ..... net 50%

Machines— Boring—
Com., Upright, Without Augers..$2.00
Com., Angular, Without Augers. $2.25
Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3	$4.25	No. 1 $5.00
Improved No. 4	3.75	No. 2 3.38
Improved No. 5	2.75	
Jennings'	No. 4, 3.15	No. 1, 3.50
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75

Fence—
Williams' Fence Machines ..... each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%

Ice Cutting—
Chandler's ..... 15&10%

Washing—
Boss Washing Machine Co.:	Per doz.
Boss No. 1; Boss Rotary	$57.00
Boss No. 7; Dietz Rotary	$60.00
Champion Rotary; Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$26.00
Cinti Square Western	$30.00
Uneeda American, Round	$29.00

Mallets—
Hickory ..... 45&5@50%
Lignumvitæ ..... 45&5@50%
Tinners', Hickory and Applewood, doz ..... 50@55c

Mats— Door—
Elastic Steel (W.G. Co.) 10%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk*

Mills— Coffee, etc.—
Enterprise Mfg. Co ..... 25@30%
National, list Jan. 1, 1902 ..... 30%
Parker's Columbia & Victoria. 50&10@60%
Parker's Box and Side ..... 50&10@60%
Sun. No. 1060, 1 ℔ mill ..... ₱ doz $8.00
Swift, Lane Bros Co 30%

Mowers, Lawn—
Net prices are generally quoted.
Cheap ..... all sizes. $1.90@1.95
Good ..... all sizes, $2.25@3.50

	10	12	14	16-inch
High Grade	4.25	4.50	4.75	5.00
Continental				60&5%
Great American				70%
Great American Ball Bearing, new list				70%
Quaker City				70%
Pennsylvania				60&5%
Penn., Ivania, Jr., Ball Bearing				60%
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Philadelphia:				
Styles M., S., C., K., T				70&10%
Style A, all Steel				60&10%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, low list				50&5%

Nails—
Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899 ..... 85@85&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C	25¢	23¢	22¢	21¢	21¢	40&5%
Ausable	28¢	26¢	25¢	24¢	23¢	50&10%
C. B. K	25¢	25¢	22¢	21¢	21¢	40%
Champi'n	28¢	26¢	25¢	24¢	23¢	50%
Clinton	19¢	17¢	16¢	15¢	14¢	30&10&5%
Maud S	25¢	23¢	22¢	21¢	21¢	50%
Putnam	23¢	21¢	20¢	19¢	18¢	33⅓%

Putnam
Cold Rol'd 19¢ 18¢ 17¢ 16¢ ..... 10&10%
American, Nos. 5 to 10 ₱ ℔ ..... 9@9½¢
Neponset ..... Nos. 5 to 10¢ ₱ ℔ 12¢
Jobbers' special brands, per lb. 8@8½¢

Picture
	1½	2	2½	3	3½ in.
Brass Head	.45	.60	.70	.95	1.00 gro.
Por. Head	..	1.10	1.10	1.10	.. gro.

Nippers, See *Pliers and Nippers.*

Nuts—
Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain ..... $4.80@4.90
Hexagon, plain ..... $5.10@5.20
Square, C. T. & R ..... $5.00@5.10
Hexagon, C. T. & R ..... $4.80@4.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank ..... $5.80@5.90
Hexagon Blank ..... $6.40@6.50
Square Tapped ..... $5.60@5.70
Hexagon Tapped ..... $6.20@6.30

Oakum—
Best or Government ..... lb. 6¼c
Navy ..... lb. 4¾c
U. S. Navy ..... lb. 5¼c
Plumbers' Spun Oakum 8¾c
In carload lots ¼c lb. off f. o. b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper ..... 65@65&10%
Tin or Steel ..... 70&10&10@75%
Zinc ..... 75@75&10%
Chase or Paragon:
Brass and Copper ..... 45&10@50%
Tin or Steel ..... 75@75&10%
Zinc ..... 66@60&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
American Tube & Stamping Co.:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc ..... 60@60&10%

Openers— Can—
French ..... doz. 35c
Iron Handle ..... doz. 25@27c
Sprague, Iron Hdle., per doz 35@40c
Sardine Scissors..doz. $1.75@$3.00
Marvel ..... per doz. $1.25
National 50%
Stowell's Sprague ..... per doz. 38@45¢
Tip Top ..... per doz. $0.75
Trulmph Shear ..... ₱ gro. $9.00

Egg—
Nickel Plate ..... per doz., $2.00
Silver Plate ..... per doz., $4.00

Packing—
Asbestos Packing, Wick and Rope, 14½@15c lb.

Rubber—
Sheet, C. I ..... 8@10c
Sheet, C. O. S ..... 9@13c
Sheet, C. B. S ..... 10@14c
Sheet, Pure Gum ..... 50@65c
Sheet, Red ..... 40@50c
Jenkins' Standard, ₱ ℔ 80¢ ...25@25&5%

Miscellaneous—
American Packing ..... 7@10c lb.
Cotton Packing ..... 14@16c lb.
Italian Packing ..... 9@12½c lb.
Jute ..... 4@4½c lb.
Russia Packing ..... 8@11c lb.

Pails— Creamery
S. S. & Co., with gauges.. No 1 $6.25; No. 2, $5.50 ₱ doz.

Galvanized—
Price per doz.

Quart	*10*	*12*	*14*
Water, Regular	*1.50*	*1.75*	*2.00*
Water, Heavy	*2.75*	*3.00*	*3.25*
Fire, Rd. Bottom	*2.30*	*2.60*	*2.80*
Well	*2.25*	*2.50*	*2.75*

Pans— Dripping—
Standard List ..... 60¢&10@60¢&10¢&5%

Fry—
Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.95*	*1.05*	*1.15*	*1.30*	*1.65*

Roasting and Baking—
Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper—
Asbestos: *lb.*
Building Felt 2¾c
Mill Board, sheet, 40 x 40 inches 3½c
Mill Board, roll, thicker than 1-16 inch 3¾c
Mill Board, roll, 1-16 in. thick and less 2¼c

	Per roll
Rosin Sized Sheathing: 500 sq. ft.	
Light wt., 25 lbs. to roll	*$0.43@0.50*
Medium wt., 30 lbs. to roll	*$0.48@0.55*
Heavy wt., 40 lbs. to roll	*$0.68@0.75*
Black Water Proof Sheathing, 500 Sq ft, 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 3, 6 and 4½ sq. ft. to lb., ton	*$45.00*
Red Rope Roofing, 250 sq. feet per roll	*$1.65*

NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.
1 ply (roll 200 sq. ft.), ton..$35 50@37.00
2 ply, roll 108 sq. ft ..... 60@65c
3 ply, roll 108 sq. ft ..... 85@90c
Slater's Felt (roll 500 sq. ft.) 75c
NOTE.—*Above prices often include delivery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—
Flint ..... 60@60¢&10%
Garnet ..... 25@25¢&15%

Parers— Apple—
Advance ..... ₱ doz. $4.50
Baldwin ..... ₱ doz. $5.00
Bonanza Improved ..... each $6.50
Dandy ..... each $7.50
Eureka Improved ..... each $10.00
Family Bay State ..... ₱ doz. 15.00
Improved Bay State ..... ₱ doz. $6.00
New Lightning ..... ₱ doz. $7.50
Reading 72 ..... ₱ doz. $4.00
Reading 78 ..... ₱ doz. $7.00
Turn Table '98 ..... ₱ doz. $6.75
White Mountain ..... ₱ doz. $6.00

Potato—
Saratoga ..... ₱ doz. $7.00
White Mountain ..... ₱ doz. $6.00

Picks and Mattocks—
List Feb. 23, 1899...60¢&10@60¢&10¢&10%

Pinking Irons—
See *Irons, Pinking.*

Pins— Escutcheon—
Brass ..... 60@60¢&10%
Iron, list Nov. 11, '85.. ...60@60¢&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in ..... 50¢&10%
Extra Heavy, 2-6 in 65%
Fittings 70%

Pipe, Merchant,
Steel or Iron, Carload Lots.

	f. o. b, Pittsburgh. *Black.*	*Galvanized.*
Merchant Pipe.		
⅛, ¼, ⅜ inch	*68%*	*58%*
½ inch	*70%*	*60%*
¾ to 6 inch	*75%*	*65%*
7 to 12 inch	*69%*	*59%*

Pipe, Sewer—
Jobbers' Prices—

Standard Pipe and Fittings, 2 to 24 in.	
New England	*70%*
New York and New Jersey	*75%*
Maryland, Delaware, East Penn.	*75%*
West Penn and West Va	*75%*
Virginia	*75%*
Ohio, Michigan and Ky	*75%*
Carload lots are generally delivered.	

Pipe, Stove—
Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.50	$8.50
6 in., per 100 joints	8.00	9.00
7 in., per 100 joints	9.00	10.00

Planes and Plane Irons—
Wood Planes—
Bench, First quality ....40¢&5@40¢&10%
Bench, Second qual ....60¢&5@50¢&10%
Molding ....33⅓¢&5@33⅓¢&10%
Bailey's (Stanley R. & L. Co) 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Toy and German ..... 40@40&10%
Gage Self Setting 35%
Union 60%

Iron Planes—
Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Sargent's ..... 60@60&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons ..... 30¢&5@30¢&10%
Buck Bros 30%
Chapin-Stephens Co ..... 30@30&10%
Stanley R. & L. Co ..... 20&10@20&10&10%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand.
Kohler's Eclipse ..... ₱ doz. $8.50

Plates—
Felloe ..... lb. 3¼@4c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00 ..... 50%

Pliers and Nippers—
Button Pliers ..... 75@75¢&10%
Gas Burner, per doz., 5 in., $1.25@ $1.30; 6 in., $1.45@$1.50

Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$2.00	*$2.25*	*$3.00*	*$3.75*

Acme Nippers ..... 50@50&5%
Bernard's:
Cutting Nippers 33⅓%
Parallel, Pliers 33⅓%
Paragon Pliers 50%
Lodi Pliers 50%
Elm City Fence Pliers 33⅓%
Cronk & Carrier Mfg. Co.:
American Buttoa ..... 75&10%
Cronk's 60%
Improved Button ..... 70&10%
Stub's Pattern 50%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40& 0&10%
P., S. & W. Tinners' Cutting Nippers, ... 30@50&10%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin Stephens Co.:
Plumbs and Levels ..... 30@30&10&10%
Chapin's Imp. Brass Cor ..... 40@40&10&10%
Pocket Levels ..... 50@50&10&10%
Level Glasses ..... 60@60&10&10%
Disston's Plumbs and Levels 70%
Disston's Pocket Levels ..... 25&10%
C. E. Jennings & Co.'s Iron 50%
C. E. Jennings & Co.'s Iron, Adjustable ..... 50&10%
Stanley R. & L. Co ..... 30&10@30&10&10%

Stanley's Duplex.....20@20&10&10%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $3.00; No. 2, $ .00; No. 3, $0.00; No. 4, $12.00.....50%

Points, Claziers'—

Bulk and 1 lb. papers.. lb. 8½c@8¾c
½-lb. papers.....lb. 8½c@9 c
¼-lb. papers.....lb. 9 c@9¼c

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ ℔ boxes, ₱ doz. $1.25; 1 ℔ boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 ℔ cans.. ₱ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ ℔ cans, ₱ gro. $9.00
Black Kid Paste, 5 ℔ can.....each, $0.65
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ ℔ 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 ℔ pail.....each 70¢
Black Silk, ½ ℔ box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. 11.00
2 qt., Square.....gro. 13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb. each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each.....25c
King's Semi-Smokeless:
Keg (25 ℔ bulk).....$6 50
Half Keg (12½ ℔ bulk).....$3.50
Quarter Keg (6¼ ℔ bulk).....$1.90
Case 24 (1 ℔ cans bulk).....$8.50
Half case (1 ℔ cans bulk).....$4 50

King's Smokeless:	Shotgun	Rifle
Keg (25 ℔ bulk).....	$12 00	$15.00
Half Keg (12½ ℔ bulk)	6.25	7.75
Quarter Keg (6¼ ℔ bulk)	3.25	4.00
Case 24 (1 ℔ cans bulk)...	14.00	17 00
Half case 12 (1 ℔ cans blk)	7.25	8 75

Robin Hood Smokeless Shot Gun..50&20%

Presses—Fruit and Jelly—

Enterprise Mfg. Co.....20@25%
Sensible.....33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Cyclops.....50%
Dudly Improved Nail Puller.....50%
Miller's Falls, No. 3, per doz. $12.00..... 33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $30 00.....50%
Pexican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 3 B (large).....$5.50
No. 2 B (small).....$3.00
Smith & Hemenway Co.:
Alix.....60%
Diamond B, No. 2, case lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....40%
Yankee.....66⅔%

Pulleys—Single Wheel—

Inch.....	*2*	*2½*	*3*
Awning...doz	*$0.55*	*.85*	*1.15*

Hay fork, Swivel or Solid Eye..... doz., 4 in, $1.15; 5 in., $1.40

Inch	*2*	*2¼*	*2½*
Hot House..doz	*$0.70*	*.90*	*1.25*
Inch ...	*1¼*	*1½*	*1¾*	*2*
Screen.....doz	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¼*	*2*	*2¼*	*2½*
Sink.....doz	*$0 30*	*.40*	*.55*	*.63*
Inch.....	*1¼*	*1¾*	*2*	*2½*
Tackle ....doz	*$0.30*	*.42*	*.58*	*1.00*

Stanley's:
Ceiling or End, Anti-Friction..60&10%
Hand Walter, Anti-Friction...60&10%
Electric Light.....60%
Sash, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in..16@19c
Auger Mortise, no Face Plate, per doz. 1¾ and 2 in.....16@19c
Auger Mortise, with Face Plate, per doz., 1¾ and 2 in.....18@19c
Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2 in. ₱ doz 50%
Grand Rapids All Steel Noiseless...50%
Ideal.....70&5%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....80@80&5%
Wood.....50@50&10%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	*2*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*

Inch..	*3*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Barnes Dbl. Acting (low list).... 50&10%
Contractors Rubber Diaphragm No. 2 B. & L. Block Co.....$16.00
Daisy Spray Pump.....₱ doz. $7.20
Flint & Walling's Fast Mail (low list).80%
Flint & Walling's Pitcher Spout.....80%
National Specialty Mfg. Co., Measuring, $8.00.....30%
Mechanical Sprayer.....$7.20
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $3.50@3.75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Benard Spring Belt Punches.....33⅓%
Lodi Spring Belt Punches.....50%
Morrill's No. 1 (A.B.C.), ₱ doz., $15.00..50%
No. 2, ₱ doz. $22.50.....50%
Hercules, each $7 50.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Paragon Spring Belt Punches.....50%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ *in.*
$1.70	*$2.10*	*$3 00 100 feet.*

Angular for Sq. Groove Wheels:

Small	*Med.*	*Large.*
$1.60	*1.95*	*2.70 100 feet.*

Sliding Door, Iron Painted....2½@3c
Sliding Door, Wrought Brass, 1¼ in.....lb.36c...30%
Allith Mfg. Co. Reliable Hanger Track ₱ foot.....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3¼¢
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $3.90; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros., ₱ ft. 11¢.....60%
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....50%
McKinney's None Better.....₱ ft. 3¾¢
McKinney's Standard.....₱ ft. 4 ¢
Myers' Stayon Track.....50&10%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special.....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel.....30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail.....₱ ft. 1¾¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, 1 3-16 in.... ₱ ft. 3¢
Stowell's Wrought Bracket, 1¼x5-16.... ₱ ft. 7¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

Rakes—

Net Prices, Malleable Rakes:

	10	*12*	*14*	*16-tooth*
Shank.....	*$1.50*	*1.60*	*1.75*	*1.85*
Socket.....	*$1.65*	*1.80*	*1.95*	*2.10*

Steel, Garden and Gravel, Aug. 1, '99 List.....70%
Weldless Steel.....75&5%
Malleable Iron, Garden.....70&10%
Lawn Rakes, Metal Head, per doz, 20 teeth.....$3.25@3.50
24 teeth.....$3.50@3.75
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz., net, $4.25

Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3 45
Lawn Queen, 24-tooth, ₱ doz.....$3.60
Paragon, 20 tooth, ₱ doz.....$2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$2.88
Malleable Garden, 14-tooth, ₱ doz..$2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5@70&10&5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10@75% See also *Files.*

Razors—

Borasic.....60 & 10%
Fox Razors, No. 42, .. ₱ doz. $20.00 } 40%
Fox Razors, No. 44, a ₱ doz, $20.00 } dis.
Fox Razors, No. 52, Platina, ₱ doz. } -25.00
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%
Safety Razors.....40%

Safety Razors—

New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades.....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.)..... ₱ doz. $15.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $27.00

Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼ 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3 04 N, 06 N, 4 N to 8 PN.....33⅓%
6 RW, 102 P and RN, 202 P and PN.40%
G 9.....20%
24 N to 28 PN.....35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and PRN, 202 PR and PRN....50&5%
2904 N.....40&10&5%
5009 PN and N.....50%
2904 P.....50&10&5%
2904 PN.....60%
0924 N.....40&10%
02084 N.....45&12½&5%
Single Action Trout.....40&10%
9x6 P N, 802 and 802 N.....50&10%
Competitor, 304 and 304 PN.....35%
6304 P and PN.....40 &5%
Safety and Salmon.....30%

Registers—*List July 1, 1903.*

Black Jap.....
White Jap.....
Bronzed.....
Nickel Plated.....
Electro Plated.....
} *70&10@75 & 10%*

Registers, Cash—

Sun, No. 10, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

Revolvers—

Single Action.....85@90c
Double Act n, except 44 cal.....$1.90
Double Action, 44 caliber.....$2.05
Automatic.....$5.60
Hammerless.....$4.10
Note.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in., per doz.....$2.25@$2.50
17 in., per doz.....$2.50@$2.75
18 in., per doz.....$2.75@$3.00

Rings and Ringers—Bull Rings—

	2	*2½*	*3 Inch.*
Steel.....	*$0 70*	*0.75*	*0.80 doz*
Copper.....	*1.00*	*1.15*	*1.40 doz.*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4, 5@4.50
Hill's Ringers, Gray Iron, doz. 55@60c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.50@5.75
Brown's Ringers..per doz. $0.75@ .85

Rivets and Burrs—

Copper.....50¢10@50¢10¢10%
Iron or Steel:
Tinners'.....75¢10@75¢10¢5%
Miscellaneous.....70¢10@75%

Rollers—

Acme Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....60&10%
Cronk's Brinkerhoff.....60%
Lane's Stay.....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.00

Rope—

Manila, 7-16 in. diam, and larger, tarred or untarred.....lb. 11½@12c.
Manila, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 11½@12 c
Sisal, 7-16 in. diam. and larger:
Mixed.....lb. 8¼@ 8¼c
Pure.....lb. 9¼@ 9¼c
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....lb. 8¼@ 8¼c
Pure.....lb. 9¼@ 9¼c
Sisal, Tarred, Medium Lath Yarn:
Mixed.....lb. 7¾@ 8 c
Pure.....lb. 8¼@ 8¼c
Cotton Rope: (—Lb.)
Best.....¼-in. and larger.. 15@16c
Medium..¼-in. and larger.. 13@14c
Com ....¼-in. and larger.. 9@10c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6½c
Thread No. 2, ¼-in. and up, lb. 6 c
Old Colony Manila Transmission Rope, ₱ ℔ 17½¢

Wire Rope—

Galvanized.....50¢&5%
Plain.....45¢&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute.....40&5%
Sisal.....20%
Covert Saddlery Works.....60&5%

Rules—

Boxwood.....60&10@60¢10¢5%
Ivory.....35¢10@35¢10¢5%
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10.4
Miscellaneous.....50@50&10&10%
Combination.....55@55&10%
Stationers'.....10@10&10%
Lufkin's Steel.....50&10%
Lufk'n's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35@10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

Sash Locks—See *Locks, Sash*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames....30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&5%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in wide.....60%
Band, ¼ to 2¾.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 7⅞, 77, 8.....25%
Hand Saws, Nos 7 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Keyhole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s.:
Back Saws.....25&10%
Butcher Saws.....30&10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20&2½&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws.....30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Han I Saws, Bay State Brand.....45%
Compass, Keyhole, &c.....25@25&7½%
Wood Saws.....35@35&7½%
Wheeler, Madden & Clemson Mfg. Co.'s
Cross Cut Saws.....50%

Hack Saws—

Atkins' Hack Saw Blades A A A.... 25%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180..... 35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames.....35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....25%
Sterling Hack Saw Frames.....30& 0&5%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Bishop's Lightning.....₱ doz. $3 00
Covert's Saddlery Works.....60&10%

Scales—

Family, Turnbull's.....30@30¢10%
Counter:
Hatch, Platform, ½ oz to 8 lbs. doz. $5.50
Two Platforms, ½ oz to 8 lbs. doz. $16
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective," 25 lbs.....50%
Union or Family No. 2.....60%
Portable Platform (reduced list).....50%
Wagon or Stock (reduced list)..25@35%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle.....doz. $2.25@2.50
Box, 2 Handle.....doz. $3.00@3 50
Ship Light, $2.50; Heavy, $4.00
Adjustable Box Scraper (S. R. & L. Co) $6.00.....30@30&10%
Chapin-Stephens Co., Box.....50@50&10%

Screens, Window, and Frames—

Flyer Pattern Window Screen...60@60&5%
Maine Window Screen Frames ..40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames....60&5%
Porter's:
Fairview Window Screens..... 60&5@60&5&2½%
Hummer Window Screens..... 60&5@60&5&2½%
Klondike Window Screens..... 60&5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in.. $2.50@2.75 :
1⅛, $3.00@3.25: 1¼, $3.50@3.75
Bench, Wood, Beech....doz. 30@30&5
Hand, Wood.....30@30&5%
R. Bliss Mfg. Co, Hand.....30%
Chapin-Stephens Co., Hand.....30@30&10%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1. '99.....75@75&10%
Coach and Lag, Gimlet Point, list Oct. 1. '99.....70&10@75&5%
Hand Rail, list Jan. 1, '81.60&10@...%

Jack Screws—

Standard List.....75&10@80&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&5%
Sargent.....70%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass50@50&10%

Set and Cap—

Set (Iron or Steel) 70%
Sq. Hd. Cap.....65%
Hex. Hd. Cap.....65%
Rd. or Fillister Hd. Cap 60%

Wood—

List July 23, 1903.
Manufacturers' printed discounts :
Flat Head, Iron.....87½&10@...%
Round Head, Iron.....85&10@....%
Flat Head, Brass.....85&10@....%
Round Head, Brass....80&10@....%
Flat Head, Bronze....77½&10@....%
Round Head, Bronze.....75&10@...%
Drive Screws.....87½&10%

Scroll Saws—See *Saws, Scroll.*

Scythes— *Per doz*

Clipper Pattern, Grass...$4.25@$5.00
Full Polished Clipper.....$4.75@$5.50
Grain.....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Weed and Bush.....$4.50@$5.00

Seeders— Raisin—

Enterprise.....25@30%

Sets— Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools .. doz. $2.50@2.60
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&30&10&10%

Garden Tool Sets—

Ft. Madison, Three Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

Nail—

Square.....per gro. $2.25@2.50
Round, Blk. and Pol., assorted..... gro. $1.80@2.00
Octagon.....gro. $4.00@4.25
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70&10@75%

Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.63.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal, Cross Cut .....₱ doz. $8.50
Royal, Hand.....₱ doz. $5.00
Taintor Positive, ₱ doz. $18 .....60%

Shaving—

Fox Shaving Sets, No. 30, per doz, $24.00 net

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....63%

Shaves Spoke—

Iron.....doz. $1.00@1.15
Wood.....doz. $1.75@2.00
Bailey's (Stanley R. & L. Co.) ..... 30@30&10&10%
Chapin-Stephens Co .....30@30&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality, Jap.....70@70&10%
" Nickel.....60@60&10%
Fair qual. Jap.....80@80&5%
" Nickel.....75@75&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....10%
Wilkinson's Hedge .....1900 list 45%
Wilkinson's Branch, Lawn and Border..... 40%
Wilkinson's Sheep .....1900 list. 50%

Tinners' Snips—

Steel Blades .....20&5@20&10
Steel Laid Blades .....40&10@50%
Forged Handles, Steel Blades, Berlin ..... 40@40&10%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch .....40&7½&10%
Niagara Snips 40%
P., S & W. Co.....20%
Triumph Pipe Shear.....₱ doz. 9.00

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25%
Disston's Pruning Hook, ₱ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....40@40&5%
Orange Shears.....50&10@50&20%
Grape .....40&10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction 50%
Patent Roller Hatfield's, Sargent's list, 70&10%
Reading.....50%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....50%
R. & E. list.....33⅓%
Sargent's list.....50&10%

Shells— Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.. 65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge.....20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....30&10%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade .....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg:
Iron.....per keg $3.85
Steel.....per keg 3.60
Burden's, all sizes, ₱ keg.....$3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.60
Drop, B and larger, per 25-lb. bag $1.85
Buck, 25-lb. bag.....$1.85
Chilled, 25-lb. bag.....$1.85
Dust Shot, 25-lb bag.....$2.00

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation..gro. $11.00@11.50
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11 00
Shaker (Barler's Pat.) Flour Sifters.. ₱ doz., $3.00.....90%

Sieves, Tin Rim—

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Black, full size	$1.20	1.25	1.30	1.35
Plated, full size	$1.30	1.35	1.40	1.45
Black, scant	$0.95	1.00	1.05	

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.90@0 95
Mesh 20, Nested, doz..... 1.00@1.05
Mesh 24, Nested, doz..... 1.30@1.40

Sinks—

Cast Iron—

Standard list.....60@60&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins, Wagon—

Cast Iron.....70@70&10%
Malleable Iron.....40&10@50%
Steel.....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....45%
Noiseless Slates.....60&4 tens &5%
Wire Bound.....40%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No. 10, $2.00.....33⅓

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Derby.....30&5&2½
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2½
Yankee, Roller.....30&5&2½
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community Solid Swivel.....60%
Sargent's Patent Guarded .....60%&10%

Snaths—

Scythe.....45&5@50&12½&5%

Snips, Tinners'—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&10&5%
Cheap.....60@60&10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver.....60@60&10%
Cattaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 10&10%

Tinned Iron—

Teas.....per gro. 45@50c
Tables.....per gro. 90c@$1.00

Springs— Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider :
Black or ⅛ Bright, lb.....4¾@5 c
Bright, lb. .....5¼@5½c
Painted Seat Springs :
1½ x 2 x 26 per pr.....50@55c
1½ x 2 x 28 per pr.. .....60@65c
1½ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... } List Jan. 5, 1900.
Steel and Iron... } 70&10@70&10&10%
Rosewood Hdl Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels, 50&10@40&10&10%
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter..... 40&10@40&10&10%

Squeezers— Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50 : No. 1, $6.25@$6.50.
Wood, Porcelain Lined.
Cheap .....doz. $2.00@2.75
Good Grade.....doz. $3.00@3.50
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined doz. $2.90@3.25

Staples—

Barbed Blind. .....lb. 6@6½c
Electricians', Association list..... 80&10&10&10%
Fence Staples, See Trade Report.
Galvanized, 15c less than Barb Wire
Polished 20c less than Barb Wire.
Poultry Netting, Staples....per lb.. 5¼@5¼c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%

Steelyards.....25&10@30&10%

Stocks and Dies—

Blacksmiths'.....40&10@50%
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.80
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S....₱ gro. $9.00
Green Mountain S. S...₱ gro. $6.00
Extra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S..₱ gro. $7.00
No. 2 Indian Pond S. S..₱ gro. $4.50
Leader Red End S. S....₱ gro $4.50
Balance of 1901 list 33⅓% } 40%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:
Arkansas Stone, No. 1, 3to5¼in. $2.80
Arkansas Stone, No. 1, 5¼to8in. $3.50
Arkansas Slips No. 1 .....$4.00
Lily White Washita 4 to 8 in....60¢
Rosy Red Washita, 4 to 8 in .... 60¢
Washita Stone, Extra, 4 to 8 in..50¢
Washita Stone, No. 1, 4 to 8 in..40¢
Washita Stone, No. 2, 4 to 8 in..30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
India Oil Stones (entire list) .....33⅓% } 33⅓%
Hindostan No. 1, Regular.....₱ lb. 8¢
Hindostan No. 1 Small.....₱ lb. 10¢
Axe Stones (all kinds) .....
Turkey Oil Stones, ex. 5 tos in. ₱ lb. 80¢
Queer Creek Stones, 4 to 8 in.....20¢
Queer Creek Slips.....40¢
Sand Stone.....5¢
Belgian, German and Swatty Razor Hones.....50%
Natural Grit Carving Knife Hones, ₱ doz.....$3.00
Quick Edge Pocket Knife Hones, ₱ doz.....$3.00
Mounted Kitchen Sand Stone, ₱ doz.....$1.50 } 40%

Stoners— Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60&60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots....20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@60c
Socket.....doz. $1.75
Excelsior Stretcher and Tack Hammer Combined, per doz. $6.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, 1902.....30&5%

Sweepers, Carpet—

National Sweeper Co.: Per doz.
Loyal, Roller Bearing, Fancy Veneers.....$25.00
Marion, Roller Bearing, regular finishes, full Nickel.....$24.00
Marion Queen, Roller Bearing, full Nickel.....$24.00
Monarch, Roller Bearing, Nickel..$22.00
Monarch, Roller Bearing, Jap'ned..$20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....$8 .00
Monarch Extra, Roller Bearing, (17-inch case), Nickel.....$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned.....$33.00
National Queen, Fancy Veneers..$7.00
Perpetual, Regular Bearings, Nkl.$30.00
Perpetual, Regular Bearings, Jap.$18.00
NOTE.—*Discount of 30c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American .....90c&25c&5@....%
American Cut Tacks..90c&20c&5@....%
Swedes Iron Tacks...90c&30c&5@....%
Swedes Upholsterers' Tacks..... 90c&45c&10c&5@....%
Gimp Tacks.....90c&45c&5@....%
Lace Tacks.....90c&40@....%
Trimmers' Tacks..90c&30c&10c&5@....%
Looking Glass Tacks....70c&10@....%
Bill Posters' and Railroad Tack.... 90c&45c&5@....%
Hungarian Nails ....80c&20c&5@....%
Common and Patent Brads.....80c&10%
Trunk and Clout Nails...80c&5@....%
NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights ** and an extra 10c&5% on Standard Weights.****

Miscellaneous—

Double Pointed Tacks...90 and 5 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list., 50&10&60%
See also *Nails, Wire.*

Tanks, Oil—

	Each.
Emerald, S. S. & Co.....30-gal	$3.25
Emerald, S. S. & Co.....60-gal.	$4.00
Queen City S. S. & Co., 30-gal.	$3.65
Queen City S. S. & Co., 60-gal.	$4.50

Tapes Measuring—

American Asses' Skin.....40&10@50%
Patent Leather.....25@30&5%
Steel.....40@40&5%
Chesterman's.....25@25&5%
Keuffe. Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓&35%
Lufkin's Metallic.....30@30&5%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs..$3.00

Thermometers—

Tin Case.....80c&10@80c&10&5%

Ties, Bale—Steel Wire.

Single Loop.....80@82½
Monitor, Cross Head, Etc.....70%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Coopers'—
L. & I. J. White ..... 20@20&5%

Hay—
Myers' Hay Tools 50%
Stowell's Hay Carriers 5%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Saw—
Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—
L. & I. J. White 25%

Transom Lifters—
See *Lifters, Transom.*

Traps—Fly—
Balloon, Globe or Acme ..... doz. $1.15@1.25; gro. $11.50@12.00
Harper, Champion or Paragon ..... doz. $1.35@1.40; gro. $13.00@13.50

Game—
Oneida Pattern ..... 80@30&5%
Newhouse ..... 45@45&5%
Hawley & Norton ..... 65@65&5%
Victor (Oneida Pattern) ..... 75@75&5%
O.C Junn (Blake Pattern) 60@5@60&10%

Mouse and Rat—
Mouse, Wood, Choker, doz. holes ..... 8½@9c
Mouse, Round or Square Wire ..... doz. 85@90c

Marty French Rat and Mouse Traps (genuine):
No. 1, Rat. Each $1.12½; ₱ doz. $12.00
No. 3, Rat. ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat. ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse. ₱ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse. ₱ doz. $2.75; case of 150 $2.25

Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 ..... 50%

J. M. Mast Mfg. Co.: Per gro.

	Mouse.	Rat.
Blizzard	No. 12, $3.00	No. 1, $9 50
Old Nick	No. 30, 2.22	No. 2, 8.40
Joker	No. 5, 2.10	No. 3, 8.40

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2 40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

Trimmers Spoke—
Bonney's Nos. 1 and 2 ..... 33⅓%
Wood's E 1 ..... 50%

Trowels—
Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ..... ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in ..... ₱ gro. $6.00
Never-Break Steel Garden Trowels ..... gro. $6.00
Rose Brick and Plastering ..... 25&5%
Woodrough & McParlin, Plastering .. 25%

Trucks, Warehouse, &c.—
E. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, Improved pattern ..... ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.13*	*5.67*	*6.48*

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz., net	5.70	6.50	7.20	6.30	7 20	8.10

Twine—Miscellaneous—

Flax Twine—	BC	B.
No. 9, ¼ and ½-lb. Balls	21c	23c
No. 12, ¼ and ½ lb. balls	17c	19c
No. 18, ¼ and ½-lb. Balls	15c	17c
No. 24, ¼ and ½-lb. Balls	15c	17c
No. 36, ¼ and ½-lb. Balls	14c	16c
Chalk Line, Cotton, ½-lb Balls		*25c*
Cotton Mops, 6, 9, 12 and 15 lb. to doz		*9c*
Cotton Wrapping 5 Balls to lb ... according to quality		*12½c@23c*
American 2-Ply Hemp, ¼ and ½-lb. Balls		*13@14c*
American 3 Ply Hemp, 1-lb. Balls		*13@14c*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)		*8c*
India 3-Ply Hemp, 1-lb. Balls		*8c*
India 3-Ply Hemp, 1½-lb. Balls		*7c*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls		*9@10c*
Mason Line, Linen, ½-lb. Balls		*15c*
No. 26½ Mattress, ¼ and ½-lb Balls		*37c*
Wool, 3 to 6 ply		*5½@6c*

Vises—
Solid Box ..... 50&10@50&10&5

Parallel—
Athol Machine Co:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Bonney's 33⅓%
Columbian Hdw. Co 40%
Emmert Universal:
Pattern Makers' No. 1 ..... $15.00
Pattern Makers' No 2 ..... $12.50
Machinist and Tool Makers' No. 4. $12.50
Fisher & Norris Double Screw ..... 15&10%
Hollands':
Machinists' ..... 40@40&5%
Key-stone ..... 65&5@70%
Lewis Tool Co ..... 20@30%
Merrill's 20%
Miller's Falls ..... 60&10%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan s ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists 40%
Jewelers 33⅓%
Snediker's X. L 33⅓%
Stephens' 33⅓%

Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 ..... 40%
Disston's D 3 Clamp and Guide, ₱ doz $30 ..... 25%
Perfection Saw Clamps, ₱ doz. $8 00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—
Bignall & Keeler Combination Pipe Vise 60%
Hollands' Combination Pipe .... 60@60&5%
Parker's Combination Pipe:
87 Series 60%
187 Series ..... 60&5%
No. 870 ..... 40%

Wads—Price Per M.

B. E., 11 up	.....	*60c*
B. E., 9 and 10	.....	*70c*
B. E., 8	.....	*80c*
B. E., 7	.....	*80c*
P. E., 11 up	.....	*$1.00*
P. E., 9 and 10	.....	*1.25*
P. E., 8	.....	*1.50*
P. E., 7	.....	*1.50*
Ely's B. E., 11 and larger		*$1.70@1.75*
Ely's P. E., 12 to 20		*$3.00@3.25*

Dis. 15%

Ware Hollow—Cast Iron, Hollow—
Stove Hollow Ware:
Ground ..... 50&10@60%
Unground ..... 60&5@65%
White Enameled Ware:
Maslin Kettles 70%
Covered Ware:
Tinned and Turned 40%
Enameled 50%
See also *Pots Glue.*

Enameled—
Agate Nickel Steel Ware ..... 50&20
Agate Nickel Steel Ware, Specials ..... 60&15%
Iron Clad Ware ..... 70&10%
Lava, Enameled ..... 40&10%
Never Break Enameled 50%

Tea Kettles—
Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.
Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders & Griddles. .... 65&5%
Solid Steel Kettles 60%

Warmers, Foot—
Pike Mfg. Co., Soapstone ..... 40@40&10%

Washboards—
Solid Zinc: ₱ doz
Crescent, family size, bent frame. $3.00
Red Star, family size, stationary protector $3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.65
Cable Cross, family size, stationary protector $2.90
Single Zinc Surface:
Naiad, familysize, open back perforated $2.40
Saginaw Globe, protector, family size, ventilated back $2.35
Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—Leather, Axle—
Solid ..... 80@10@80@10@10%
Patent ..... 90@90@5%
Coil: ⅜ 1 1¼ 1¼ *Inch.*
11c 12c 13c 14c per box

Iron or Steel—
Size bolt .... 5-16 ⅜ ½ ⅝ ¾
Washers .... $.70 1.80 3.50 3.50 3.10
In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.

Cast Washers—
Over ½ inch, barrel lots. per lb. ..... 1¾@2c

Waterers, Hog—
Improved Dewey. ₱ doz $13.00

Wedges—
Oil Finish ..... lb. 2.90@3.10c

Weights
Hitching—
Covert's Saddlery Works ..... 60&10%

Sash—
Per ton, f.o.b. factory:
Eastern District $26.00
Western, Central and Southern Districts $27.00

Wheels, Well—
8-in., $1.60@1.80; 10-in., $2.00@2.25; 12-in., $2.45@2.65; 14-in., $4.00@4.25

Wire and Wire Goods—
Bright and Annealed:
6 to 9 ..... 72½@5@72½@10%
10 to 18 ..... 72½@10@72½@10@5%
19 to 26 ..... 75@75½@75@10@7½%
27 to 36 ..... 75@10@75@10@80@2½%
Galvanized:
6 to 18 ..... 70@70@5%
19 to 26 ..... 72½@5@72½@10%
27 to 36 ..... 72½@10@72½@10@5%
Coppered:
6 to 9 ..... 70@5@70@10%
10 to 18 ..... 70@10@70@10@5%
19 to 26 ..... 75@75½@75@10@2½%
27 to 36 ..... 75@10@75@10@5%
Tinned:
6 to 14 ..... 75@75@7½%
15 to 18 ..... 72½@5@75%
19 to 26 ..... 70@5@70@5@5%
27 to 36 ..... 70@70@5%
Annealed Wire on Spools ..... 70@70@5%
Brass and Copper Wire on Spools. ..... 60@60@5%
Brass, list Feb. 26, '96 ..... 50%
Copper, list Feb. 26, '96 ..... 15%
Cast Steel Wire 50%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List June 24, 1903 ..... 90@90@10%

Wire Cloth and Netting—
Galvanized Wire Netting ..... 80@10%
Painted Screen Cloth per 100 ft. $1.15
Standard Hardware Grade
Nos. 2, 2½ and 3 Mesh, sq. ft. 3c
Nos. 4 and 5 Mesh, sq. ft. 3½c
No. 6 Mesh, sq ft 3½c
No. 8 Mesh, sq ft 4c

Wire Barb—See *Trade Report.*

Wrenches—
Agricultural ..... 80@80&10%
Baxter Pat'rn S Wrenches ..... 70@5@70@10%
Drop Forged S ..... 45@45@5%
Acme ..... 60&10%
Alligator 70%
Aligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright 40%
Merrick's Pattern 50%
No. 3 Pipe, Bright 55%
Boardman's 33⅓%
Coes' Genuine Knife H'l ..... 40&10&5&5%
Coes' Genuine Steel Hdl ..... 40&10&5&5%
Coes' Genuine Key Model ..... 40&10&5&5%
Coes' "Mechanics' ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Combination ..... 50&10&5%
Dudly Pipe ..... 50&10&5%
Dudly Adjustable Pipe ..... 40&10&5%
Eagle ..... 50&10%
Elgin Wrenches 40%
Elgin Monkey Wrench Pipe Jaws 33⅓%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots ..... 50&5%
Less than case lots 50%
Improved Pipe (W. & B.) 60%
Solid Handles, P.S. & W ..... 50@50&5%
Stillson 65%
Triumph ..... 60&10%
Vulcan Chain 50%

Fruit Jar—
T & B Fruit Jar Wrenches ..... ₱ gro $3 00
Triumph Fruit Can Wrenches, ₱ gro $9.60
Triumph Fruit Jar Holders .. ₱ gro. $15.00

Wrought Goods—
Staples, Hooks, &c., list March 17 '92 ..... 90@90@5%

Yokes Neck—
Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' .. list net

Zinc—
Sheet ..... lb 7 @7¼¢

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.
Lead, English white, in Oil ..... 7½@ 9⅜
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price ..... @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price ..... @ 1½
Lead, American, Terms: For lots 12 tons and over 1/8 rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls ..... 5¾@ 6¼
Zinc, American, dry ..... ₱ ℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8¾
Zinc, Paris, Green Seal, dry ..... @ 9¾
Zinc, Antwerp, Red Seal, dry ..... @ 6¾
Zinc, Antwerp, Green seal, dry ..... @ 8¾
Zinc, V. M. French, in Poppy Oil, Green Seal
Lots of 1 ton and over ..... 12 @12½
Lots of less than 1 ton ..... 12½@12¾
Zinc, V. M. French, in Poppy Oil, Red Seal
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11@11½
Discounts:—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon ..... ₱ ℔ 5 @10
Black, Drop, American ..... 4 @ 6
Black, Drop, Eng ..... 5 @15
Black, Ivory ..... 16 @20
Blue, Celestial ..... 4½@ 6
Blue, Chinese ..... ₱ ℔ 4 @ 6
Blue, Prussian ..... 29 @32
Blue, Ultramarine ..... 27 @30
Brown, Spanish ..... 4½@15
Brown, Vandyke ..... ½@ 1
Carmine, No. 40 ..... ₱ ℔ $3.25@3.50
Green, Chrome, ordinary ..... 3½@ 6
Green, Chrome, pure ..... 17 @25
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Ocher, French Washed ..... 5 @ 7
Ocher, Dutch Washed ..... 5 @ 7
Ocher, American ..... ₱ ton $ 5.50@16.00
Orange Mineral, English ..... ₱ ℔ 8¼@ 9½
Orange Mineral, French ..... 10½@11½
Orange Mineral, German ..... 9 @10½
Orange Mineral, American ..... 8 @ ..
Red, Indian, English ..... 4½@ 8½
Red, Indian, American ..... 3 @ 3¼
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer., ₱ 100 ℔ ..... 50@1.50
Red Venetian, English, ₱ 100 ℔ 1.25@1 75
Sienna, Italian, Burnt and Powdered ..... ₱ ℔ 3 @ 6½
Sienna, Ital., Raw, Powd ..... 3 @ 6½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ₱ ℔ 1½@ 2
Talc, French ..... ₱ ℔ 2 @ 2½
Talc, American ..... 90 @1.25
Terra Alba, French, ₱ 100 ℔ .. 95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 ..... 85 @85
Terra Alba, American No. 2 ..... 45 @50
Umber, Turkey, Bnt. & Pow. ₱ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 11 @14
Vermilion, American Lead ..... 10 @25
Vermilion, Quicksilver, bulk ..... @70
Vermilion, Quicksilver, bags ..... @71
Vermilion, English, Import ..... 80 @85
Vermilion, Chinese ..... $0.90@1.00

Colors in Oil.
Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @40
Blue, Prussia ..... 32 @36
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 11 @14
Green, Chrome ..... 10 @15
Green, Paris ..... @24
Sienna, Raw ..... 12 @15
Sienna, Burnt ..... 12 @15
Umber, Raw ..... 11 @14
Umber, Burnt ..... 11 @14

Miscellaneous.
Barytes, Foreign, ₱ ton ..... $18.00@20.00
Barytes, Amer. floated ..... 18.50@20.00
Barytes, Crude, No. 1 ..... 8.50@11.00
Chalk, in bulk ..... ₱ ton 3.00@ 3.25
Chalk, in bbls ..... ₱ 100 ℔ .. @ 35
China Clay, English .. ₱ ton 11.00@17.00
Cobalt, Oxide ..... ₱ 100 ℔ 2.50@ ...
Whiting, Common ₱ 100 ℔ .45@ .48
Whiting, Gilders ..... .55@ .57
Whiting, extra Gilders' ..... .58@ .60

Putty.
In bladders ..... 1¾@2½
In bulk ..... 1½@2
In cans 1 ℔ to 5 ℔ ..... 2 @4½
In cans 12 ½ ℔ to 25 ℔ ..... 1½@2¾

Spirits Turpentine.
In Oil bbls ..... 60 @60½¢
In machine bbls ..... 60½@32 ¢

Glue.
Cabinet ..... ₱ ℔ 11½@16
Common Bone ..... 6½@ 8
Extra White ..... 18 @23
Foot Stock, White ..... 11½@ 13½
Foot Stock, Brown ..... 7½@10
German Hides ..... 12½@16
French ..... 12 @40
Irish ..... 13½@16
Low Grade ..... 9 @12
Medium White ..... 14½@16½

Animal, Fish and Vegetable Oils.
Linseed, City, raw ..... ₱ gal..39 @ 40
Linseed, City, boiled ..... 41 @42
Linseed, State and West'n, raw 36 @38
Linseed, raw Calcutta seed .... 75 @ ..
Lard, Prime, Winter ..... 60 @ ..
Lard, Extra No. 1 ..... 58 @ ..
Lard, No. 2 ..... 40 @ ..
Cotton-seed, Crude, f.o.b mills, 26½@29
Cotton-seed, Summer Yellow, prime ..... 39 @40
Cotton-seed, Summer Yellow, off grades ..... 35½@37
Sperm, Crude ..... @ ..
Sperm, Natural Spring ..... 63 @64
Sperm, Bleached Spring ..... 65 @66
Sperm, Natural Winter ..... 67 @68
Sperm, Bleached Winter ..... 69 @70
Tallow, Prime ..... 49 @ ..
Whale, Crude ..... @ ..
Whale, Natural Winter ..... 46 @47
Whale Bleached Winter ..... 48 @49
Menhaden, Brown, Strained .. 31 @32
Menhaden, Light Strained ..... 32 @33
Menhaden, Bleached Winter .. 34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon ..... 5¼@ 5½
Cocoanut, Cochin ..... 5¾@ 6½
Cod, Domestic ..... 37 @38
Cod, Newfoundland ..... 41 @42
Red Elain ..... 45 @46
Red Saponified ..... ₱ ℔ 43@ 47½
Olive, Italian, bbls ..... 50½@ 51¾
Neatsfoot, prime ..... 54 @ ..
Palm, prime, Lagos ..... ₱ ℔ 5¾@ 6

Mineral Oils.
Black, 30 gravity, 25@30 cold test ..... ₱ gal. 13 @14
Black, 29 gravity, 15cold test. 14 @15
Black, Summer ..... 13 @14
Cylinder, light filtered ..... 20½@21½
Cylinder, dark filtered ..... 18½@19½
Paraffine, 903-907 gravity ..... 15 @15½
Paraffine, 903 gravity .. .. 14 @14½
Paraffine, 883 gravity ..... 11¾@12
Paraffine, red ..... 14 @15½
In small lots ½¢ advance.

CURRENT METAL PRICES.

OCTOBER 28, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1⅜ in. round and square, ₩ ℔ .... @1.95¢
1¼ to 4 in. x ⅜ to 1 in. .... @2.15¢
1¼ to 4 in. x ¼ to 5-16 .... @2.15¢
Rods—⅜ and 11-16 round and square, ₩ ℔ .... @2.15¢
Angles: Cts ₩ ℔
3 in. x ¼ n. and larger .... 2.25¢
3 in. x 3-16 in. and ⅛ in. .... 2.50¢
1¼ to 2½ in. x ⅛ in. .... 2.30¢
1¼ to 2¾ in. x 3-16 in. and thicker .... 2.25¢
1 to 1¼ in. x 3-16 in .... 2.30¢
1 to 1¼ x ¼ in. .... 2.40¢
⅞ x ⅛ in. .... 2.50¢
⅝ x ⅛ in. .... 2.60¢
⅝ x ¼ in. .... 3.40¢
⅞ x ¼ in. .... 3.40¢
¼ x 3-32 in. .... 3.90¢
Tees:
1 in. .... 2.80¢
1¼ in. .... 2.60¢
1¼ in. and larger .... 2.50¢
Beams .... 2.50@3.00¢
Channels, 3 in. and larger .... 2.50@3.00¢
Bands—1¼ to 6 x 3-16 to No. 8 .... ₩ ℔ 2.40¢
"Burden's Best" Iron, base price .... ₩ ℔ 2.90¢
Burden's "H. B. & S. Iron, base price .... ₩ ℔ 2.70¢
"Ulster" .... ₩ ℔ 3.15¢
Norway Bars .... 3.75@4.25¢
Norway Shapes .... 4.00@4.50¢

Merchant Steel from Store—

per ℔
Bessemer Machinery .... 2.05¢
Toe Calk, Tire and Sleigh Shoe .... 2.30@3.00¢
Best Cast Steel, base price in small lots .... 7¢

Soft Steel Sheets—

¼ inch	2.30¢	No. 14	2.60¢
3-16 inch	2.30¢	No. 16	2.70¢
No. 8	2.30¢	No. 18	2.80¢
No. 10	2.40¢	No. 20	2.90¢
No. 12	2.50¢	No. 22	3.00¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	G. R. Cleaned.
Nos. 14 to 16	₩ ℔ 2.75	2.95¢
Nos. 18 to 21	₩ ℔ 2.85	3.05¢
Nos. 22 to 24	₩ ℔ 2.95	3.15¢
Nos. 25 and 26	₩ ℔ 3.05	3.25¢
No. 27	₩ ℔ 3.15	3.35¢
No. 28	₩ ℔ 3.25	3.45¢

Russia, Planished, &c.

Genuine Russia, according to assortment .... ₩ ℔ 11½@14¢
Patent Planished, ... ₩ ℔ A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 .... ₩ ℔, 3.16¢
Nos. 18 to 20 .... ₩ ℔, 3.42¢
Nos. 22 to 24 .... ₩ ℔, 3.69¢
No. 26 .... ₩ ℔, 3.95¢
No. 27 .... ₩ ℔, 4.22¢
No. 28 .... ₩ ℔, 4.48¢
No. 30 .... ₩ ℔, 5.55¢
No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast .... ₩ ℔ 15 ¢
Extra Cast .... ₩ ℔ 18 @ 20 ¢
Swaged, Cast .... ₩ ℔ 16 ¢
Best Double Shear .... ₩ ℔ 15 ¢
Blister, 1st quality .... ₩ ℔ 13 ¢
German Steel, Best .... ₩ ℔ 10 ¢
2d quality .... ₩ ℔ 9 ¢
3d quality .... ₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality .... ₩ ℔ 15 ¢
2d quality .... ₩ ℔ 14 ¢
3d quality .... ₩ ℔ 12 ¢
R. Mushet's "Special" .... ₩ ℔ 46 ¢
" " "Titanic" .... ₩ ℔ 19 ¢
Hobson's Choice XX Extra Best .... ₩ ℔ 85 ¢
Jessop Self Hardening .... ₩ ℔ 45 ¢
Seamans' "Nelson" Steel .... 40 ¢
Hobson's "Soho" Special Self-Hardening .... ₩ ℔ 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per ℔
Banca, Pigs	27 @27½¢
Straits, Pigs	27 @27½¢
Straits in Bars	27¼(@28¼¢

Tin Plates—

American Charcoal Plates.

Calland Grade:
IC, 14 x 20 .... $6.75
IX, 14 x 20 .... 8.25
Melyn Grade:
IC, 14 x 20 .... 6.50
IX, 14 x 20 .... 7.75
Allaway Grade:
IC, 14 x 20 .... 5.50
IX, 14 x 20 .... 6.60

American Coke Plates—Bessemer—

IC, 14 x 20 .... 108 ℔ .... $4.60@4.70
IX, 14 x 20 .... $5.90@6.15

American Terne Plates—

IC, 20 x 28 .... $9.00
IX, 20 x 28 .... $11.00

Copper—

DUTY: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake .... 14¼¢
Casting .... 13½¢

Sheet and Bolt—

October 22, 1903. Net

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	56 oz. to 64 oz., 25 to 50 lb.	24 oz. to 30 oz. 12½ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9¾ to 11 lb.	10 oz. and 11 oz. 7¾ to 9⅜ lb.	8 oz. and 9 oz. 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	18	19	19	19	20	21	22	25	28
30	96	72	18	19	19	19	20	22	25	28	
30	.....	96	18	19	19	19	21	25			
36	72	.....	18	19	19	19	21	23	26	29	
36	96	72	18	19	19	19	21	25	28		
36	120	96	18	19	19	20	22				
36	.....	120	18	19	19	21	25				
48	72	.....	18	19	18	21	23	26	29		
48	96	72	18	19	18	22	24	27			
48	120	96	18	19	21	23	27				
48	.....	120	18	20	22	25					
60	72	.....	19	19	20	22	25	30			
60	96	72	18	19	21	23	26				
60	120	96	18	20	22	25					
60	.....	120	18	21	23	27					
72	96	.....	18	22	22	27					
72	120	96	18	21	24	29					
72	.....	120	19	22	27						
108	96	.....	19	22	25						
108	120	96	20	23	26						
108	.....	120	21	24	28						
wider than 108	132	.....	22	25							
	.....	132	23	24							

Rolled Round Copper, ⅜ inch diameter and over, ₩ ℔ 20¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ ℔ advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ ℔ over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ ℔ advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 3¢ ₩ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ ℔ .... 33¢
12 oz. and up to 14 oz. to square foot, ₩ ℔ .... 24¢
10 oz. and up to 12 oz., ₩ ℔ .... 25¢
Lighter than 10 oz., ₩ ℔ .... 26¢
Circles less than 8 in. diameter, 2¢ ₩ ℔ additional
Circles over 13 in. diameter are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1¢ ₩ ℔ extra.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
List Feb. 20, 1901.

Nos.	0000 to 8	9 and 10	11 and 12
	Base	¼¢	¼¢ ₩ ℔ adv.
Nos.	13	14	15	16
	¼¢	¾¢	1¼¢ ₩ ℔ adv.
Nos.	17	18	19	20
	1¼¢	2¢	2¼¢	2¾¢ ₩ ℔ adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W. G.	B. & S. W. G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	.....	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	...	41	37	35	33	31	30	29	28	27	25	24
15	13	...	42	38	36	33	32	31	30	30	28	26	25
16	14	...	43	39	37	34	33	32	31	30	29	26	25
17	15	...	44	40	38	35	34	33	32	31	30	27	26
18	16	61	46	42	39	36	35	34	32	31	30	28	27
19	17	62	47	43	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	51	50	46	44	43	42	41	40	39	39	39
24	23	81	56	53	48	46	45	44	43	41	40	42	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
30	32	29	27	21	21	21	21	21	21	21	23	23	25	27	28¢ ₩ ℔

Copper, Bronze or Gilding Tubes, 3¢ ₩ ℔ additional

Brazed Brass Tubing.

(*To No.* 19, *inclusive.*) Jan. 6, 1898.
Brown & Sharpe's gauge standard.

			Per ℔.
Plain Round Tube, ¾ n. up to 2 in.			$0.35
"	"	⅞ "	.36
"	"	1 "	.38
"	"	1¼ "	.41
"	"	1½ "	.48
"	"	1¾ "	.55
"	"	2 "	.65
Smaller than ¼ inch			Special
2 inch to 3 inch, to No. 19, inclusive			.38
3 inch			.40
Over 3 inch to 3½ inch, inclusive			.45
Over 3½ inch			.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 2 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24	in. 24 26
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39
Common High Brass Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	in.
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.73	

* Special prices not less than 80 cents.
Add ¼¢ ₩ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 25%

Wire in Coils.

List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilding bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 25%; Copper Wire, Net List November 16, 96.
Spring Wire, 2¢ ₩ ℔ advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ ℔, net .... 19¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ ℔ net, 20¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ ℔
Western Spelter .... 6½@6⅝¢

Zinc.

Duty: Sheet, 2¢ ₩ ℔.
No. 9, base, casks .... 7½¢ | Open, per ℔ .... 8¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ ℔. Pipe and Sheets, 3½¢ ₩ ℔.
American Pig .... 4½@5¢
Bar .... 5½@5¾¢
Pipe .... ₩ ℔ 5.10¢
Tin Lined Pipe .... ₩ ℔ 12¢
Block Tin Pipe .... ₩ ℔ 37½¢
Sheet Lead .... ₩ ℔ 6¢
Old Lead in exchange, 3½¢ ₩ ℔

Solder.

½ & ½, guaranteed .... 18 @18½¢
No. 1 .... 16 @17 ¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ½¢ ₩ lb.
Cookson .... ₩ ℔ 7½@7¾¢
Hallett's .... ₩ ℔ 6¾@6¾¢

Aluminum—

Duty: Crude, 8¢ ₩ ℔. Plates, Sheets, Bars and Rods, 13¢ ₩ ℔.
No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting:
Small lots .... ₩ ℔ 37¢
100-℔ lots .... ₩ ℔ 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots .... ₩ ℔ 34¢
100-℔ lots .... ₩ ℔ 33¢
Aluminum Sheet, B. & S. gauge, 50 ℔ or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ ℔.	₩ ℔.	₩ ℔
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.61
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 ℔ 5¢ ₩ ℔ extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ ℔ 40¢	No. 15	₩ ℔ 43¢
No. 9 to No. 10	₩ ℔ 40½¢	No. 17	₩ ℔ 50¢
No. 11	₩ ℔ 41 ¢	No. 18	₩ ℔ 55¢
No. 12	₩ ℔ 41½¢	No. 19	₩ ℔ 60¢
No. 13	₩ ℔ 42 ¢	No. 20	₩ ℔ 65¢
No. 14	₩ ℔ 42½¢	No. 21	₩ ℔ 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ ℔ 10¾¢
Light and Tinned Copper	₩ ℔ 9¾¢
Heavy Brass	₩ ℔ 7 ¢
Light Brass	₩ ℔ 5½¢
Lead	₩ ℔ 3½¢
Tea Lead	₩ ℔ 3½¢
Zinc	₩ ℔ 4¼¢
No. 1 Pewter	₩ n17 ¢
No. 2 Pewter	₩ ℔ 8 ¢
Pure Aluminum, Sheet, ₩ ℔	21¢
Cast Aluminum, ₩ ℔	16¢
Tin Plate scrap	₩ ton $4.50@5.00
Wrought Scrap Iron	₩ gross ton $11.50@14.00
Heavy Cast scrap	₩ gross ton $11.50@13.00
Stove Plate Scrap	₩ gross ton $9.50@10.00
Burnt Iron	₩ gross ton $9.50@ 9.00